



Food Technology Abstracts

Fishery
Phytochemistry
TECHNOLOGY
starch
Pesticide Science
Food Technology in New Zealand
Journal of Agricultural and Food Chemistry
Meat Science
Journal of Food Protection
BRITISH POULTRY SCIENCE
FOOD TECHNOLOGY IN AUSTRALIA
food product development
FOOD MANUFACTURE
Indian Food Packer
Package Engineering
Journal of Food Quality
JOURNAL OF THE SCIENCE OF FOOD AND AGRICULTURE
Journal of Stored Products Research
Cereal Chemistry
Modern Packaging
PESTICIDES
Chemistry and Industry
Lebensmittel-Untersuchung und -Forschung
American Journal of Enology and Viticulture
CSIRO Food Research Quarterly
JOURNAL OF FOOD SCIENCE AND TECHNOLOGY
Indian Journal of Technology
Getreide Mehl und Brot
Journal of Food Science
Milk Industry
CACAO
CACAO
CANNER
PACKER
Journal of Microbiology
KOSMETIK
INDIAN COFFEE
Journal of Food Technology
Indian Journal of Biochemistry & Biophysics
Research & Industry
APPROPRIATE TECHNOLOGY
Journal of Texture Studies
Annales de technologie agricole
THE INDIAN JOURNAL OF NUTRITION AND DIETETICS
FRUITS
Australian Fisheries
Perfectpac
Food Technology
ACTA ALIMENTARIA
Food Technology
INTERNATIONAL FLAVOURS AND FOOD ADDITIVES
Progress in Food & Nutrition Science
FOOD IN CANADA
Soybean Digest
Food Engineering



National Information Centre
for Food Science and Technology,
Central Food Technological
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ANON. Highlights. Agriculture, food and rural development.
Agric. Situation India. 37(1); 1982; 17-9

PANTUCEK (A). Phases of planning and know how transfer as important elements of planning.
Flussiges Obst. 47(5); 1980; 211-3 (German)

WENLOCK (RW), BUSS (DM), DERRY (BJ) and DIXON (EJ). Household food wastage in Britain.
Br. J. Nutr. 43(1); 1980; 53-70

A survey conducted in UK showed that the food wasted in homes averaged 11.71 MJ (2790 kcal)/household per week in summer and 10.1 MJ (2410 kcal)/household per week in winter equivalent to 0.6 MJ (150 kcal) and 0.5 MJ (130 kcal)/person per day respectively. This is less than one-quarter of the gap between food supplies and the amount of food thought to be eaten in the UK. When assessed against the expected usage of food in the home, wastage accounted on an average 6.5% of the energy intake in summer and 5.4% in winter. KAR

ANON. Quality control begins with cleaning.
Tea Coffee Trade J. 153(11); 1981; 16-7, 11.

FOOD PROCESSING AND PACKAGING

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Food Technol. Aust. 33(8); 1981; 364-6

TEALE (S). Quiet revolution in can closers.
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HEYDE (M). Empirical representation of heat and mass transfer on circulation through static spherical packings.
Chemie Ingenieur Technik. 52(8); 1980; 654-5 (German)

FOOD ENGINEERING AND EQUIPMENT

EL GAMMAL (T) and DICKHAUS (W). Fundamental studies and chemical engineering proposals regarding the use of fused metal carbonates for desulphurization of exhaust gases.
Chemie Ingenieur Technik. 52(7); 1980; 588-9 (German)

ELSTNER (F) and ONKEN (U). Influence of liquid phase properties on mass transfer in gas/liquid dispersions.
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STEINER (L) and HARTLAND (S). Modelling of extraction columns with use of backmixing theory.
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LUCAS (K). Condensation in pipes Analysis of practical methods of calculation.
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LEUENBERGER (H), BIER (HP) and SUCKER (H). Theory and practice of determining the granulation liquid requirement in conventional granulation.
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- 13 HENZLER (H-J). Aeration of relatively viscous liquids.
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- 14 PONTER (AB), PFENNIGWERTH (GL) and MANGERS (RJ). Liquid film mass transfer coefficients for packed columns using organic and aqueous systems.
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- 15 LECLUSE (WJ). Theory and application of high pressure homogenization.
Chemie-Ingenieur-Technik. 52(8); 1980; 668-9 (German)

ENERGY IN FOOD PROCESSING

- 16 SEAL (KC). Energy statistics in India.
Energy Dig. 1(12); 1982; 1-4
- 17 GURUMURTI (K) and RATURI (DP). *Sesbania grandiflora*.
Energy Dig. 1(12); 1982; 9-15
- 18 PRASAD (HK) and SHARMA (AN). Biogas plants and their prospects.
Agric. Situation India. 37(2); 1982; 93-5
- 19 JAIN (BC). Solar water heating.
Energy Dig. 1(4); 1982; 1-10
- 20 UNKLESBAY (NF), UNKLESBAY (KB) and HENDERSON (JM). Simulation of energy used by foodservice infrared heating equipment with bentonite models of menu items.
J. Food Prot. 43(10); 1980; 789-94

FOOD CHEMISTRY AND ANALYSIS

- 21 MAGA (JA). Phytate: Its chemistry, occurrence, food interactions, nutritional significance and methods of analysis.
J. Agric. Food Chem. 30(1); 1982; 1-9
Discusses: chemistry, occurrence (barley, dry beans, corn, cottonseed, peanut, peas, rapeseed, rice, sesame, soy, sunflower, wheat, miscellaneous foods); phytase; food interactions; nutritional considerations (zinc, calcium, iron); methods of analysis. BSN
- 22 FRANKE (WK), HENKLER (RD) and KUTHER (J). Acetoacetaldehyde dimethyl-acetal as a starting material for syntheses.
Fette Seifen Anstrichm. 82(9); 1980; 370-9 (German)
- 23 SCHLIEPHAKE (D). Crystallization from solutions.
Chemie-Ingenieur-Technik. 52(7); 1980; 553-61 (German)
- 24 MATZ (G). Fractional crystallization.
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- 25 MATZ (G). Crystallization from melts.
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- 26 MERSMANN (A). Incrustation problems - causes.
Chemie-Ingenieur-Technik. 52(7); 1980; 576-81 (German)
- 27 SUDDENDORF (RF), WATTS (JO) and BOYER (K). Simplified apparatus for determination of mercury by atomic absorption and inductively coupled plasma emission spectroscopy.
J. Assoc. Off. Anal. Chem. 64(5); 1981; 1105-10

- 8 ALLEGRINI (M), BOYER (KW) and TANNER (JT). Neutron activation analysis of total diet food composites for iodine. J. Assoc. Off. Anal. Chem. 64(5); 1981; 1111-5
- 9 HOTCHKISS (JH). Analytical methodology for sample preparation, detection, quantitation and confirmation of N-nitrosamines in foods. J. Assoc. Off. Anal. Chem. 64(5); 1981; 1037-54
- 10 FORRETTE (JE). Infrared spectrophotometric method for methazole formulations. J. Assoc. Off. Anal. Chem. 64(5); 1981; 1185-6
- 11 BRIGGLE (TV), ALLEN (LM), DUNCAN (RC) and PFAFFENBERGER (CD). High performance liquid chromatographic determination of cyanuric acid in human urine and pool water. J. Assoc. Off. Anal. Chem. 64(5); 1981; 1222-6
- 12 SEN (NP) and SEAMAN (S). Volatile N-nitrosamines in dried foods. J. Assoc. Off. Anal. Chem. 64(5); 1981; 1238-42
The levels of volatile N-nitrosamines were determined in several dried food commodities such as malt, instant skim milk powder, infant formula containing milk powder, instant coffee, soup and soup bases, and baby cereals. The detection limit was 0.1-0.5 ppb. All the 22 samples of malt and 11 samples of instant skim milk powders were positive for N-nitrosodimethylamine (NDMA), the average levels being 7.4 ppb and 0.4 ppb respectively. Traces of NDMA and/or N-nitrosopyrrolidine were also detected in 3 out of 20 dried soups, and 5 out of 10 instant coffees; traces of NDMA and/or N-nitrosopiperidine (NPIP) were detected in 3 out of 8 powdered infant formulas. All four samples of baby cereals showed negative results. KMD
- 13 LIBBEY (LM) and SCANLAN (RA). Anomalies in the mass spectrum of N-nitrosopyrrolidine. J. Assoc. Off. Anal. Chem. 64(5); 1981; 1255-6
- 14 ROMAN (R), YATES (CH), MILLAR (JF) and VANDENHEUVEL (WJA). Gas chromatographic/Mass spectrometric study of isoequilin A. J. Assoc. Off. Anal. Chem. 64(5); 1981; 1259-63
- 15 GARDNER(AM). Template for marking thin layer chromatographic plates for two-dimensional development. J. Assoc. Off. Anal. Chem. 64(5); 1981; 1264-5
A compact template for marking 200 x 200 mm thin layer chromatographic (TLC) plates for 2-dimensional TLC is described. Directions are provided for use of the easily fabricated apparatus. The template permits rapid, accurate, and reproducible marking of plates for application of samples and standards. AA
- 16 BUOGO (A), BERSANI (C), SONCINI (G) and CANTONI (C). Observations and experimental data on the Ames test for the evaluation of the possible mutagenic activity of some food products. Ind. Aliment. 19(178); 1980; 944-7 (Italian)
Several samples of bouillon cubes, and their individual components, have been examined by the Ames salmonella mammalian microsome test (spot and overlay tests) for possible mutagenic activity. No mutagenic effects were produced by the cubes, or by any of their components. KMD
- 17 CIPRIANI (I) and PATTINI (O). Nitrogen content determination according to Kjeldahl with kjeltec system. 1. apparatus. Ind. Aliment. 19(178); 1980; 927-30 (Italian)
- 18 ENTZ (RC) and HOLLIFIELD (HC). Headspace gas chromatographic analysis of foods for volatile halocarbons. J. Agric. Food Chem. 30(1); 1982; 84-8

A headspace technique for determining volatile (boiling point less than 150 C) halocarbons (VHCs), such as chloroform, 1,1,1,-trichloroethane, carbon tetrachloride, trichloroethylene, and tetrachloroethylene, in foods was developed. Food samples were placed in a septum-capped vial, 20 N H₂SO₄ was added to digest the sample, and water was added as a diluent. Some samples were analyzed without preliminary treatment, depending upon the matrix. The vial was equilibrated at 90 C for 1 hour. An aliquot of headspace was injected into a gas chromatograph equipped with an electron capture detector. VHCs were detected at sub-part-per-billion levels in aqueous foods, while for lipid-containing matrices, detection limits were in the 10-50 ppb range. By use of external standards or the method of standard additions, relative standard deviations of 20% or less were achieved. Fish and several processed foods, including jelly, chocolate sauce, ice cream, and mayonnaise, were analyzed by using the headspace technique. AA

FOOD LAWS AND REGULATIONS

- 39 MILLER (HI). The impact of new technology on regulation by the FDA: Recombinant DNA Technology. Food Drug Cosmet. Law J. 36(7); 1981; 348-53
- 40 FREY (LO). Professional sampling of controlled substances. Food Drug Cosmet. Law J. 36(7); 1981; 363-71

FOOD MICROBIOLOGY

- 41 SKOGBERG (D) and RICHARDSON (T). Enzyme electrodes for the food industry. J. Food Prot. 43(10); 1980; 808-19
This paper reviews the technology, historical development and potential and current applications of enzyme electrodes in the food industry. Proper choice of enzyme electrode and immobilization techniques are considered. An overview of potentiometric, polarographic and gas-sensing membrane electrode methods is provided. A discussion of the initial development of a variety of procedures for measuring glucose, using an assortment of electrodes and immobilization techniques is also included. Some electrodes for carbohydrate and amino acids analysis and other analytical applications for the food industry are listed as well as a number of commercially available techniques. AA
- 42 SUNDSTROM (DW), KLEI (HE), COUGHLIN (RW), BIEDERMAN (GJ) and BROUWER (CA). Enzymatic hydrolysis of cellulose to glucose using immobilized β -glucosidase. Biotechnol. Bioeng. 23(3); 1981; 473-85
- 43 LEE (GK), LESCH (RA) and REILLY (PJ). Estimation of intrinsic kinetic constants for pore diffusion-limited immobilized enzyme reactions. Biotechnol. Bioeng. 23(3); 1981; 487-97
- 44 WHITESIDE (JP) and SPIER (RE). The scale-up from 0.1 to 100 liter of a unit process system based on 3-mm diameter glass spheres for the production of four strains of FMDV from BHK monolayer cells. Biotechnol. Bioeng. 23(3); 1981; 551-65
- 45 KROUWEL (PG) and KOSSEN (NWF). Gas production by immobilized microorganisms: Calculation of theoretical maximum productivity. Biotechnol. Bioeng. 23(3); 1981; 651-5

- 16 KOIZUMI (J-I) and AIBA (S). Optimal design of bio-photoreactor: Parallel-plate reactor. *Biotechnol. Bioeng.* 23(3); 1981; 657-62
- 17 HAWKES (DL) and HORTON (R). Anaerobic digester design fundamentals. Part III. *Process. Biochem.* 16(2); 1981; 10-12
- 18 KILARA (A). Immobilized proteases and lipases. *Process. Biochem.* 16(2); 1981; 25
- 19 BORGHEI (SM). Treatment of the effluent of a glucose production plant using a rotating biological packed bed. *Process. Biochem.* 16(2); 1981; 29-30
- 20 SOLOMON (BO) and ERICKSON (LE). Biomass yields and maintenance requirements for growth on carbohydrates. *Process. Biochem.* 16(2); 1981; 44-9
- 21 COX (NA), BAILEY (JS), THOMSON (JE), CARSON (MO), POSEY (DA) and RIVERA (E). Modified procedure to inoculate micro-ID. *J. Food Prot.* 43(10); 1980; 774-7
- 22 GIBBONS (RJ) and DANKERS (I). Lectin-like constituents of foods which react with components of serum, saliva, and *Streptococcus mutans*. *Appl. Environ. Microbiol.* 41(4); 1981; 880-88
- 23 HILL (WE) and CARLISLE (CL). Loss of plasmids during enrichment for *Escherichia coli*. *Appl. Environ. Microbiol.* 41(4); 1981; 1046-8
- 24 OHKAWA (A), YAMAGIWA (K), SAKAI (N) and TAKAHARA (Y). Performance evaluation of mechanical foam-breakers utilizing the impact force of dispersed liquid particles. *J. Ferment. Technol.* 59(2); 1981; 149-55
Three mechanical foam-breakers operating on similar principles, namely, a spray nozzle (SN), a fluid impact dispersion apparatus (FIDA) and a mechanical foam-breaker with a rotating disk (MFRD), were examined quantitatively for differences in foam-breaking capacity in terms of total input power P_t and kinetic energy P_k of the dispersed liquid required at the critical state for foam-breaking. The MFRD gave the best performance of the three foam-breakers, being effective in much lower ranges of P_t and P_k than the SN and the FIDA. AA
- 25 MARTIN (GE), NOAKES (JE), ALFONSO (FC) and FIGERT (DM). Liquid scintillation counting of ^{14}C for differentiation of synthetic ethanol from ethanol of fermentation. *J. Assoc. Off. Anal. Chem.* 64(5); 1981; 1142-4
- 26 SANE (RT), KAMAT (SS) and PANDIT (AD). Colorimetric method for determination of ethanol in presence of methanol. *J. Assoc. Off. Anal. Chem.* 64(5); 1981; 1145-8
A method is described for the determination of ethanol in the presence of methanol without pre-separation. The sample is oxidized to give acetaldehyde and formaldehyde. 2-Thiobarbituric acid reagent is added and selectively forms a pink adduct with acetaldehyde, but not with formaldehyde. The method is sensitive, obeys Beer's law in the concentration range 18-80 $\mu\text{g/ml}$, and has an advantage over other methods because it does not detect any "apparent normal value" of alcohol in blood. AA

FUNGI

- 57 ANON. Fungus-based food tastes like meat.
Food Eng. Int. 6(8); 1981; 69-70

- 58 SASAKI (K), NOPARATNARAPORN (N), HAYASHI (M), NISHIZAWA (Y) and NAGAI (S). Single-cell protein production by treatment of soyabean wastes with *Rhodospseudomonas gelatinosa*.
J. Ferment. Technol. 59(6); 1981; 471-7

Rhodospseudomonas gelatinosa and *R. gelatinosa* A1 were studied to investigate the potential for treatment of wastewater from a miso factory and for utilization of the biomass produced in batch culture under aerobic-dark conditions. Optimal temperatures for growth and COD removal in soyabean cooked drain medium were 35 C for *R. gelatinosa* and 25 C for *R. gelatinosa* A1. Maximum specific growth rate, maximum biomass produced and COD removal after 40 hours for *R. gelatinosa* were 0.19 1/hour, 9.3 g cell/l and 81%, and for *R. gelatinosa* A1, 0.17, 10.6 and 79. Major sugar components in soyabean cooked drain such as sucrose (5.99 g/l) and raffinose (3.42 g/l) were almost completely consumed by two strains whereas ca. 50% of stachyose (initially 7.27 g/l) remained after 40 hours of cultivation. Biomass contained 62% of crude protein for *R. gelatinosa* and 63% for *R. gelatinosa* A1. The protein consisted of appreciable amounts of essential amino acids comparable with those of soyabean and egg proteins, and, in particular, methionine contents were 1.89 g/100 g dry cell for *R. gelatinosa* and 1.71 for *R. gelatinosa* A1. In addition, the intracellular contents of vitamin B₁₂ and carotenoid pigment were 33 µg/g cell and 150 µg/g for *R. gelatinosa* (35 C), and 23 µg/g and 24 µg/g for *R. gelatinosa* A1 (25 C). AA

ALTERNARIA

- 59 PATIL (M) and SHASTRI (NV). Extracellular production of proteases by *Alternaria alternata* (Fr.) Keissl.
J. Ferment. Technol. 59(5); 1981; 403-6

Alternaria alternata (Fr.) Keissl was found to secrete neutral and alkaline proteases extracellularly. The production of proteases was maximum in Czapek Dox medium in which glucose was replaced by 5% wheat bran. Peak production was observed after 10 days of incubation under static conditions. The optimum initial pH for the production of proteases was 6.2. AA

YEAST

- 60 URRUTIA DESMAISON (G) and SCHUGERL (K). Microflotation of the yeast *Hansenula polymorpha*.
Chemie-Ingenieur-Technik. 52(10); 1980; 855 (German)
- 61 WOEHRE (W) and ROEHR (M). Regulatory aspects of bakers' yeast metabolism in aerobic fed-batch cultures.
Biotechnol. Bioeng. 23(3); 1981; 567-81

MUSHROOM

- 62 ZETELAKI-HORVATH (K). Effect of oxygen transfer rate on protein formation and biological value of *Pleurotus ostreatus*.
Process. Biochem. 16(2); 1981; 20-24
- 63 TRESSL (R), BAHRI (D) and ENGEL (K-H). Formation of eight-carbon and ten-carbon components in mushrooms (*Agaricus campestris*).
J. Agric. Food Chem. 30(1); 1982; 89-93

The formation of volatile C₈ components and less volatile C₁₀ (C₁₁) oxo and hydroxy acids was investigated in fresh mushrooms (*Agaricus campestris*). The components were isolated from the mushrooms by distillation-extraction and liquid-liquid extraction and analyzed by capillary gas chromatography-mass spectrometry. Further characterization was made by infrared spectroscopy, ¹H NMR spectroscopy, chemical reactions, and Me₃Si derivatizations. After addition of linoleic and linolenic acids, the following components were identified for the first time in mushrooms: (Z)-2-octenal, (Z)-1,5-octadien-3-one, (Z)-1,5-octadien-3-ol, (Z,Z)-2,5-octadienal, and (Z,Z)-2,5-octadien-1-ol (partly showing intensive mushroom-like odours). 10-Oxodecanoic acid, 10-hydroxydecanoic acid, 10-oxoundecanoic acid, 10-hydroxyundecanoic acid, 10-oxo-8-decenoic acid, 10-hydroxy-8-decenoic acid, 9-oxodecanoic acid, and 9-hydroxydecanoic acid were characterized as enzymatic products from linoleic acid. AA

FOOD ADDITIVES

- 64 DEGNAN (FH). The best proof of safety for food additives and new animal drugs.
Food Drug Cosmet. Law J. 36(4); 1981; 185-90
- 65 DIXON (JM). World flavour trends.
Food Eng. Int. 6(8); 1981; 40-45
- 66 MARTIN (GE), ALFONSO (FC), FIGERT (DM) and BURGGRAFF (JM). Stable isotope ratio determination of the origin of vanillin in vanilla extracts and its relationship to vanillin/potassium ratios.
J. Assoc. Off. Anal. Chem. 64(5); 1981; 1149-53
- 67 WHISTLER (RL). Industrial gums from plants: Guar and Chia.
Econ. Bot. 36(2); 1982; 195-202

CEREALS

- 68 ERDMAN (JA) and MOUL (RC). Mineral composition of small-grain cultivars from a uniform test plot in South Dakota.
J. Agric. Food Chem. 30(1); 1982; 169-74
- 69 KAMIMURA (H), NISHIJIMA (M), YASUDA (K), SAITO (K), IBE (A), NAGAYAMA (T) USHIYAMA (H) and NAOI (Y). Simultaneous detection of several *Fusarium* mycotoxins in cereals, grains, and foodstuffs.
J. Assoc. Off. Anal. Chem. 64(5); 1981; 1067-73
- A systematic method based on column, thin layer, and gas chromatography is described for the simultaneous determination of *Fusarium* mycotoxins (nivalenol, deoxynivalenol, fusarenon-x, diacetoxyscirpenol, neosolaniol, T-2 toxin, HT-2 toxin, butenolide, moniliformin and zearalenone) in cereals, grains, and foodstuffs. The minimum detectable concentrations (µg/kg) in various test materials were: nivalenol, deoxynivalenol, and fusarenon-x, 2.0; diacetoxyscirpenol, neosolaniol, T-2 toxin, and HT-2 toxin, 80; zearalenone, 10; butenolide, 30; and moniliformin, 50. Recoveries of the mycotoxins added to various cereal samples at 1.0-2.0 µg/g were greater than 71% and averaged 85%. AA

RICE

- 70 INDUDHARA SWAMY (YM) and BHATTACHARYA (KR). Breakage of rice during milling 1. Types of cracked and immature grains.
J. Food Sci. Technol. (India) 19(3); 1982; 106-10

About 150 randomly-selected hand-dehusked grains are examined in transmitted light in a modified microbiological colony counter. Grains with (a) a single transverse crack (STC), (b) multiple transverse cracks (MTC), and (c) longitudinal (or irregular) ($\pm$ transverse) cracks (LC) can be distinguished; immature grains can be identified by their size, colour and opacity. During progressive ripening of paddy on stalk, STC appeared and increased first, but MTC and LC increased rapidly at the later stages. Controlled hydration and drying of paddy showed that sorption of water led to regular transverse cracks, while longitudinal (irregular) cracks were formed mostly upon fast drying. AA

- 71 INDUDHARA SWAMY (YM) and BHATTACHARYA (KR) Breakage of rice during milling. 4. Effect of kernel chalkiness. J. Food Sci. Technol. (India) 19(3); 1982; 125-6
- Chalkiness score and cracks were tested in 10 varieties of rice to find out whether breakage of rice during milling has relation to chalkiness of the grain. It was observed that chalkiness and cracks were mutually correlated; more the chalkiness index, the more were the cracks and *vice versa*. Chalkiness score of mature rice kernels also increased in field paddy as its harvest was delayed. AA
- 72 PILLAIYAR (P) and MOHANDOSS (R). Cooking qualities of parboiled rices produced at low and high temperatures. J. Sci. Food Agric. 32(5); 1981; 475-80
- The cooking characteristics of parboiled rice are related to (i) its hydration behaviour at temperatures above and below the gelatinization point; (ii) to kernel elongation on cooking; and (iii) to the extent of amylose solubility. Samples were prepared by parboiling paddy at 70, 80, 90, 100, 110 and 120 C. The rate of hydration at temperatures below the gelatinization point increased on parboiling and conversely a reverse pattern above this point. The temperature of parboiling influenced the linear elongation of the kernel after cooking. The soluble amylose content was negatively correlated with the temperature of parboiling. KAR
- 73 EL-SAIED (HM), AHMED (EA), EL-SHIRBEENY (AE) and EL-ATTAR (WM). Composition of starch and protein of milled rice as related to cooking process. Starch. 32(5); 1980; 162-4
- The changes in levels of starch and protein composition of milled rice were studied. Six varieties of rice were tested, 3 of the short grain and 3 of the long grain varieties. The milled rice was cooked and dried at 55 C for 24 hours till it reached about 15% moisture content. The samples were then ground into fine flour and analysed. Protein content showed gradual decrease as the period of cooking was extended. Protein contents of raw milled rice ranged from 6.79 to 7.36% for the short grain varieties, whereas they ranged from 7.79 to 8.95% for the long grain varieties. Starch contents of the raw milled rice ranged from 79.28 to 93.66% for the short grain varieties and from 81.0 to 85.82% for the long grain varieties. Starch content showed gradual decrease as the period of cooking increased and apparently the different varieties of rice differed markedly in their amounts of starch lost during cooking. KMD
- 74 TSUJI (S). Texture measurement of cooked rice kernels using the multiple-point mensuration method. J. Texture Stud. 12(2); 1981; 93-105
- A new modification of Texture Profile Analysis, a two-point mensuration method, was shown to give better differentiation between different types of cooked rice. The method involves compressing single rice kernels 50% and 90% at 240 mm/minute. Ratios of values obtained at the two compression depths were better reflectors of the texture of rice as affected by the amount of water used in cooking and by rice variety (glutinous versus non-glutinous). Data are also presented showing how

hardness, cohesiveness, adhesiveness and springiness of rice vary with compression or biting depths and with the position of the kernel in the cooker. The ratio of adhesiveness to hardness at 50% compression and the ratio of adhesiveness to hardness between the two compressions were the most useful indices. AA

- 75 DEL MUNDO (AM) and JULIANO (BO). Consumer preference and properties of raw and cooked milled rice.

J. Texture Stud. 12(2); 1981; 107-20

Consumer preference tests for raw and cooked rices were run on representative consumers 16 years and older in a selected Philippine village. For four sets of samples, major criteria for selecting raw milled rice were grain whiteness and hardness, and aroma and flavour for boiled rice. Actual preference ranks suggested partiality to white raw rice and low-amylose, intermediate-amylose and high-amylose boiled rice in order of decreasing preference. Soft texture due to low amylose content probably contributed to better flavour of boiled rice. Selection criteria for one set of waxy rices were aroma and whole, big grains for raw rice, and aroma and cohesiveness for rice cake suman sa antala. Properties disliked in suman were flakiness, and coarse, hard, and soft textures. Among five low-gelatinization temperature, waxy milled rices, the traditional, aromatic, coarse-grained Malagkit Sungsong was preferred over newer rices with less aroma and with longer grains in both raw and suman forms. AA

- 76 HANSEN (LB), CASTILLO (GD) and BIEHL (ER). Gas chromatographic-mass spectrometric characterization of an alteration product of malathion detected in stored rice.

J. Assoc. Off. Anal. Chem. 64(5); 1981; 1232-7

WHEAT

- 77 WASSERMANN (L) and MUHLBAUER (W). Influence of drying on the wheat quality. Part 2. Material and investigations. Influence of the temperature of dry air on the baking qualities.

Getriede Mehl Brot. 34(9); 1980; 225-30 (German)

The results show that the permissible value of 70 C for the grain temperatures is higher than the limiting values reported in the literature (40-55 C). Drying tests with baking wheat using transverse-flow and counter-current and reverse current driers have shown that drying can be done with an air temperature upto 80 C, without affecting the quality of the grain. This applies especially to grain of the wheat variety "Jubilar", which has a higher moist-gluten and protein content than the varieties cultivated during the period 1930-60. KMD

- 78 VETTEL (F). Experiences in winter wheat breeding: Tests on "non baking wheats with sticky dough" using the rotation viscosimeter.

Getriede Mehl Brot. 34(9); 1980; 230-9 (German)

The viscosity, as measured by a rotation viscosimeter, was used as a measure for the dough surface of wheat varieties and breeds. The conditions imposed on Weipert's method, were i) easy handling, objective measurement, sufficient output, (ii) good reproducibility, (iii) low consumption of grain and (iv) satisfactory "genotypical differentiability". The reproducibility in the case of a protein content of around 11% and a fall number >200s works out to an average 0.5 points V_A . Consequences, which result from the regression coefficients $V_A \times$ crude protein, for the crossing, were discussed. The differentiability of "usable genotypes" as component populations by means of V_A is satisfactory. The material consumption can be reduced to 25g, so that, after crossing, each generation can be examined as to whether it is "technologically bakeable or not". KMD

- 79 MATHEWSON (PR), FAHRENHOLZ (CH), BOOTH (GD), MILLER (BS) and POMERANZ (Y). Colorimetric alpha-amylase, falling number, and amylograph assays of sprouted wheat.
J. Assoc. Off. Anal. Chem. 64(5); 1981; 1243-51
Results are reported of a collaborative study on the determination of sprout damage in wheat. Methods of analysis included falling number, amylograph, and a colorimetric α -amylase assay. Data for the 3 methods were linearly interrelated. Primary source of error for each method was lack of agreement among collaborators. The 3 tests adequately differentiated among sprout damage levels within a single laboratory. The colorimetric test was the most sensitive to change in α -amylase content and appeared to have greater potential for standardization than the other 2 methods.
- 80 GRAVELAND (A). Extraction of wheat proteins with sodium dodecyl sulphate.
Ann. Technol. Agric. 29(2); 1980; 113-23
- 81 KOBREHEL (K). Extraction of wheat proteins with salts of fatty acids and their electrophoretic characterization.
Ann. Technol. Agric. 29(2); 1980; 125-32
- 82 MIFLIN (BJ), BYERS (M), FIELD (JM) and FAULKS (AJ). The isolation and characterization of proteins extracted from whole milled seed, gluten and developing protein bodies of wheat.
Ann. Technol. Agric. 29(2); 1980; 133-47
- 83 ZEHATSCHEK (W). Electrophoretic pattern of wheat glutenin from varieties of different quality level.
Getriede Mehl Brot. 34(9); 1980; 239-43 (German)
- 84 KASARDA (DD). Structure and properties of α -gliadins.
Ann. Technol. Agric. 29(2); 1980; 151-73
- 85 WRIGLEY (CW), ROBINSON (PJ) and WILLIAMS (WT). Association between electrophoretic patterns of gliadin proteins and quality characteristics of wheat cultivars.
J. Sci. Food Agric. 32(5); 1981; 433-42
In a group of 80 cultivars, gliadin patterns reflected both pedigree and taxonomic relationships. Certain gliadin bands were also found to be significantly associated with the quality characteristics of hardness and dough strength. KAR
- 86 CHARBONNIER (L), TERCE-LAFORGUE (Th) and MOSSE (J). Some physicochemical properties of *Triticum vulgare* β , γ and ω gliadins.
Ann. Technol. Agric. 29(2); 1980; 175-90
- 87 POPINEAU (Y), LEFEBVRE (J) and GODON (B). Hydrophobic properties of gliadins of some varieties of *Triticum vulgare* wheats.
Ann. Technol. Agric. 29(2); 1980; 191-204
- 88 TKACHUK (R) and METLISH (VJ). Wheat cultivar identification by high voltage gel electrophoresis.
Ann. Technol. Agric. 29(2); 1980; 207-12
- 89 WRIGLEY (CW). The genetic and chemical significance of varietal differences in gluten composition.
Ann. Technol. Agric. 29(2); 1980; 213-27
- 90 SOZINOV (AA) and POPEREIAYA (FA). Genetic classification of prolamines and its use for plant breeding.
Ann. Technol. Agric. 29(2); 1980; 229-45

- 91 BIETZ (JA) and HUEBNER (FR). Structure of glutenin: Achievements at the Northern Regional Research Centre.
Ann. Technol. Agric. 29(2); 1980; 249-77
- 92 BUSHUK (W), KHAN (K) and McMASTER (G). Functional glutenin: A complex of covalently and non-covalently linked components.
Ann. Technol. Agric. 29(2); 1980; 279-94
- 93 JEANJEAN (M-F) and FEILLET (P). Properties of wheat gel proteins.
Ann. Technol. Agric. 29(2); 1980; 295-308
- 94 PAVNE (PI), HARRIS (PA), LAW (CN), HOLT (LM) and BLACKMAN (JA). The high-molecular weight subunits of glutenin: Structure, genetics and relationship to breadmaking quality.
Ann. Technol. Agric. 29(2); 1980; 309-20
- 95 RYADCHIKOV (VG), ZIMA (VG), ZHMAKINA (OA), LEBEDEV (AV) and PHILIPAS (TB). Studies of wheat flour glutenins by modified Landry-Moureaux method and gliadins by isoelectric focusing.
Ann. Technol. Agric. 29(2); 1980; 321-35
- 96 LASZTITY (R). Correlation between chemical structure and rheological properties of gluten.
Ann. Technol. Agric. 29(2); 1980; 339-61
- 97 BATEY (IL). Chemical modification as a probe of gluten structure.
Ann. Technol. Agric. 29(2); 1980; 363-75
- 98 EWART (JAD). Determination of carboxyl groups in wheat and barley flour proteins.
J. Sci. Food Agric. 32(6); 1981; 572-8
- 99 KACZKOWSKI (J) and MIELESZKO (T). The role of disulphide bonds and their localisation in wheat protein molecules.
Ann. Technol. Agric. 29(2); 1980; 377-84
- 100 MORRISON (WR) and HARGIN (KD). Distribution of soft wheat kernel lipids into flour milling fractions.
J. Sci. Food Agric. 32(6); 1981; 579-87
The lipids in the white flour are essentially the same as in the aleurone-free starchy endosperm, supplemented with triglyceride transferred from gum. Some depletion of glycolipids and phospholipids in high grade flours may occur through fractionation of the endosperm to exclude subaleurone, and conversely low grade flours will be slightly enriched with these lipids. KAR
- 101 POMERANZ (Y). Interaction between lipids and gluten proteins.
Ann. Technol. Agric. 29(2); 1980; 385-97
- 102 BOOTH (MR), BOTTOMLEY (RC), ELLIS (JRS), MALLOCH (G), SCHOFIELD (JD) and TIMMS (MF). The effect of heat on gluten-physico-chemical properties and baking quality.
Ann. Technol. Agric. 29(2); 1980; 399-408
- 103 NAVARRO (S), AMOS (TG) and WILLIAMS (P). The effect of oxygen and carbon dioxide gradients on the vertical dispersion of grain insects in wheat.
J. Stored Prod. Res. 17(3); 1981; 101-7

TRITICALE

- 104 ZERINGUE (HJ) Jr. and FEUGE (RO). A comparison of the lipids of tritica-
cale, wheat and rye grown under similar ecological conditions.
J. Am. Oil Chem. Soc. 57(11); 1980; 373-6

Samples of triticale, wheat and rye grown in the same season at the same location in Southern United States were analyzed for amounts and types of lipids and for fatty acid composition. Selected kernels of the 3 cereals were separated into anatomical parts (bran, endosperm and germ) and analyzed for amounts and types of lipids, and the anatomical parts of triticale were analyzed for fatty acid composition. The tritica-
cale contained several times more phosphatidylcholine and phosphatidy-
lethanolamine than did the wheat and rye. Marked differences in lipid composition were found in the bran, endosperm and germ fractions; and some differences were found among corresponding fractions of the 3 ce-
reals. The bran fractions were rich in steryl esters and contained no glycolipids or phospholipids. Fatty acid compositions of the lipids from the anatomical parts of triticale exhibited some difference. AA

OAT

- 105 PERNOLLET (J-C), KIM (S-I) and MOSSE (J). Characteristics of storage
proteins extracted from *Avena sativa* seed protein bodies.
J. Agric. Food Chem. 30(1); 1982; 32-6

MILLETS

SORGHUM

- 106 DAIBER (KH) and TAYLOR (JRN). Effects of formaldehyde on protein extr-
action and quality of high- and low-tannin sorghum.
J. Agric. Food Chem. 30(1); 1982; 70-72

MAIZE

- 107 RESTANI (P), RICCARDI (A) and CERLETTI (P). Functional properties of
corn germ protein related to the interaction with water and with fats.
Ann. Technol. Agric. 29(2); 1980; 409-14
- 108 IKAWA (Y) and FUWA (H). Changes in some properties of starch granules
of maize having amylose extender gene by amylose attack.
Starch 32(5); 1980; 145-9
- 109 PAULIS (JW). Recent developments in corn protein research.
J. Agric. Food Chem. 30(1); 1982; 14-20
Discusses: properties and composition of zein; zein as markers for
corns; alcohol-soluble reduced glutelin (ASG) vs zein; alcohol-soluble
reduced glutelin; and classification of ASG. BSN
- 110 SHOTWELL (OL), BURG (WR) and DILLER (T). Thin layer chromatographic
determination of aflatoxin in corn dust.
J. Assoc. Off. Anal. Chem. 64(5); 1981; 1060-63
- 111 DAVIS (ND), GUY (ML) and DIENER (UL). Improved fluorometric-iodine
method for determination of aflatoxin in corn.
J. Assoc. Off. Anal. Chem. 64(5); 1981; 1074-6
Several innovations in the fluorometric-iodine(FL-I) method for de-
termining aflatoxin in corn made the procedure faster and more conve-
nient than the original method. AA

- 112 EL-NAKIB (O), PESTKA (JJ) and CHU (FS). Determination of aflatoxin B₁ in corn, wheat, and peanut butter by enzyme-linked immunosorbent assay and solid phase radioimmunoassay.
J. Assoc. Off. Anal. Chem. 64(5); 1981; 1077-82
Determinations of aflatoxin B₁ in corn, wheat, and peanut butter by an enzyme-linked immunoassay (ELISA) and a solid-phase radioimmunoassay (RIA) were compared. Overall results indicated that ELISA gave more consistent data, relatively lower standard deviations, and lower coefficients of variation than did RIA. Analysis of 3 samples naturally contaminated with aflatoxins revealed that the ELISA data were comparable to those obtained by other established chemical methods. AA
- 113 ANDERSON (NE) and CLYDESDALE (FM). Dietary fiber content of corn bran.
J. Food Prot. 43(10); 1980; 760-2

PULSES

- 114 ALLI (I) and BAKER (BE). Constitution of leguminous seeds. A note on protein-phytic acid interactions during isolation of acid-soluble protein from *Phaseolus* beans.
J. Sci. Food Agric. 32(6); 1981; 588-92
Acid soluble proteins isolated from three types of *Phaseolus* beans (white kidney beans, navy beans and lima beans) were found to contain phytic acid. The amount of phytic acid complexed by the proteins was unaffected by the phytic acid content of the bean extracts from which the proteins were isolated, but depended on the number of positively charged basic groups which were available for reaction with the phytate anion. KAR
- 115 OLSON (AC), GRAY (GM), GUMBMAN (MR) and WAGNER (JR). Nutrient composition of and digestive response to whole and extracted dry beans.
J. Agric. Food Chem. 30(1); 1982; 26-32
The distribution of nutrients between hot water diffusible and non-diffusible constituents of whole California small white (CSW), light red kidney, and baby lima dry beans was examined. For CSW, 15% of the solids were hot water diffusible and contained more than 90% of the sugars sucrose, raffinose, and stachyose, 12% of the nitrogen, 10% of the fat, 60% of the ash, none of the crude fiber, 60% of the thiamine, 80% of the niacin, and 0% of any detectable starch or precipitable protein of the whole beans. Protein efficiency ratios (PERs) for cooked extracted beans were the same or better than those for nonextracted beans. A 50% reduction in flatulence potential measured by hydrogen production was observed when rats were fed extracted beans. A significant reduction in subjective gastrointestinal distress was reported by human subjects interviewed 24 hours after eating cooked extracted beans compared to cooked nonextracted beans. AA

FABA BEAN

- 116 KIM (S-I), HOEHN (E), ESKIN (NAM) and ISMAIL (F). A simple and rapid colorimetric method for determination of vicine and convicine.
J. Agric. Food Chem. 30(1); 1982; 144-7
The simple and rapid colorimetric method for estimation of vicine and convicine in faba bean products is based on the complex formation between aglycons and titanium reagent. The distinct advantage of this uv technique is the inability of compounds like nucleotides and nucleosides to interfere with the titanium complex. BSN

MUNG BEAN

117. SOOD (DR), WAGLE (DS) and DHINDSA (KS). Studies on the nutritional quality of some varieties of mung bean (*Vigna radiata*). J. Food Sci. Technol. (India). 19(3); 1982; 123-5
- A study of nutritional composition of nine mung bean varieties was carried out. The proximate principles except fat, energy value and P contents did not exhibit any significant differences. Thousand kernel weight crushing hardness, Ca, Fe, methionine and tryptophan ranged from 24.07 to 53.18 g, 1.95 to 3.78 kg/seed, 88 to 198 mg, 3.70 to 8.80 mg, 160 to 360 mg and 219 to 578 mg/100 g dry weight respectively. Values varying from 9.29 to 16.57%, 0.36 to 1.98%, 7.96 to 14.59% and from 52.30 to 66.62% were noticed for total, reducing and non-reducing sugars, and biological value respectively. Variety 'K 851' and 'PS 16' appear to be quite promising from the nutritional angle. AA

COWPEA

- 118 VANDEN (T) and MENDOZA (EMT). Purification and characterization of two lipoxygenase isoenzymes from cowpea (*Vigna unguiculata* (L.) Walp). J. Agric. Food Chem. 30(1); 1982; 54-60

HARRICOT BEAN

- 119 PANT (PC) and MATHPAL (KN). Biochemical changes associated with the pod development of French bean (*Phaseolus vulgaris* L.) under Kumaon hill conditions. J. Food Sci. Technol. (India) 19(3); 1982; 100-103
- Biochemical changes with pod development in two varieties of bean viz. "V.L. Bauni-1" and "Contender" were studied. It was observed that moisture, total soluble solids, crude fibre and crude fat showed significant positive or negative correlation with pod development. Eight amino acids, namely, lysine, glycine, threonine, α -alanine, cysteine, methionine, valine and leucine were identified and found in varying concentrations at different stages of pod development. Concentrations of lysine, α -alanine and methionine were found to increase with pod development. The period between 18 to 22 days after fruit set was found suitable for picking the pods for vegetable purpose. KAR
- 120 PHILLIPS (DE), EYRE (MD), THOMPSON (A) and BOULTER (D). Protein quality in seed meals of *Phaseolus vulgaris* and heat-stable factors affecting the utilization of protein. J. Sci. Food Agric. 32(5); 1981; 423-32
- Removal of testa from the high polyphenol content varieties significantly increased the true digestibility (TD), but not in low-polyphenol variety. Testa removal did not significantly change the biological value (BV). Supplementation with methionine or cystine raised the BV to that of egg albumin. The polyphenol content of bean meals did not appear to affect the utilization of their sulphur containing amino acids. KAR

JACK BEAN

- 121 HOOVER (WL) and MELTON (JR). Jack bean meal as source of urease in determination of urea. J. Assoc. Off. Anal. Chem. 64(5); 1981; 1256-8
- Ground jack bean was added to feed samples as a source of urease in urea determinations. Jack bean meal is much less expensive and is more stable in the presence of soluble salts than is refined urease powder. Percent recoveries in terms of protein equivalent for 3 types of feed ranged from 96.1 to 98.9, using the proposed method. Jack bean meal

was equal or superior to refined urease powder in converting urea to ammonia in all samples analyzed. AA

LOCUST BEAN

- 122 DOUBLIER (JL) and LAUNAY (B). Rheology of galactomannan solutions: Comparative study of guar gum and locust bean gum. J. Texture Stud. 12(2); 1981; 151-72

WINGED BEAN

- 123 DELUMEN (BO) and FIAD (S). Tocopherols of winged bean (*Psophocarpus tetragonolobus*) oil. J. Agric. Food Chem. 30(1); 1982; 50-53
HPLC and UV detection at 295 nm of oil samples extracted from 27 varieties of winged bean (*Psophocarpus tetragonolobus*) seeds, showed that γ -tocopherol was the most dominant form of tocopherol present along with traces of α -, β - and δ -tocopherols. Most of the samples were within the range of 23-44 mg γ -tocopherol/100 g oil, while a few showed as high as 130 mg or as low as 8 mg/100 g γ -tocopherol. The tocopherol to polyunsaturated fatty acid ratio was calculated to be 0.2 mg of d- α -tocopherol equivalent/g of polyunsaturated fatty acids, a value almost similar to soyabean oil. and less than that of other vegetable oils. BSN
- 124 CHAN (J) and DELUMEN (BO). Biological effects of isolated trypsin inhibitor from winged bean (*Psophocarpus tetragonolobus*) on rats. J. Agric. Food Chem. 30(1); 1982; 46-50
- 125 CHAN (J) and DELUMEN (BO). Properties of trypsin inhibitor from winged bean (*Psophocarpus tetragonolobus*) seed isolated by affinity chromatography. J. Agric. Food Chem. 30(1); 1982; 42-46

OILSEEDS AND NUTS

- 126 KATHURIA (OP) and RAO (DVS). Growth rates of some important oilseed crops in India. Agric. Situation India. 36(12); 1982; 875-80
- 127 LAKSHMINARAYANA (G). A symposium on processing of oilseeds, oils, by-products and derived products: Techno-economic aspects. J. Oil Technol. Assoc. India. 13(4); 1981; 127-9
The author has summarized the proceedings of the symposium, and presented the full text of the recommendations that were formulated at the symposium. KMD
- 128 AUSTIN (RE) and WYATT (DM). A rapid method for analysis of refined vegetable oils for TBHQ by gas chromatography. J. Am. Oil Chem. Soc. 57(12); 1980; 422-4
A simple and rapid extraction technique using acetonitrile solvent has been used to extract TBHQ antioxidant from refined soyabean and cottonseed oils. The extracts have been analyzed by a gas chromatographic technique, using silyl derivatization, to quantitate the TBHQ content of the oil. The method has been calibrated using 14 data points for linear regression, showing a coefficient of determination of 0.9587. Average recoveries over a 14-day period range from 102 to 106.6% at the 50-150 ppm levels. The overall test standard deviation, which includes the effects of time, is 5.9. AA

ALMOND

- 129 GARD (H), COCKEY (J), CUNNION (P) and WRIGHT (W). Almonds, coconut and peanuts. Now and down the road. Manuf. Confect. 61(9); 1981; 36-8

- 130 SAURA CALIXTO (F) and CANELLAS (J). Determination of inorganic elements in the almond. II B, S, Cl & N. An. Bromatol. 32(4); 1980; 375-80 (Spanish)
Boron has been determined by means of azomethine-H, sulphur by turbidimetric methods, and nitrogen and chlorine by means of ion-selective electrodes. Mediterranean almonds belonging to the varieties Pons, Canaleta, and Marcona contained on an average 0.22 mg B, 130 mg S, 12 mg Cl, and 0.37 mg N per 100 g of almonds. KMD

GROUNDNUT

- 131 THARANATHAN (RN), PARAMAHANS (SV) and WANKHEDE (DB). Amylolytic susceptibility of native groundnut and ragi starch granules as viewed by scanning electron microscopy. Starch. 32(5); 1980; 158-61

The amylolytic susceptibility of groundnut and ragi (finger millet) starch granules was investigated, using glucoamylase II from *Aspergillus niger* and salivary α -amylase. The rate of hydrolysis was followed by estimating the amounts of glucose and maltose released. The degradation patterns were observed using the scanning electron microscope. This revealed that in groundnut starch, attack by both the enzymes was uniform and resulted in several types of pitting, whereas ragi starch, although undergoing greater degradation than groundnut starch, showed only a few corrosions that resulted in little change in surface structures. AA

- 132 BASHA (S-MM) and PANCHOLY (SK). Isolation and characterization of two cryoproteins from florunner peanut (*Arachis hypogaea* L.) seed. J. Agric. Food Chem. 30(1); 1982; 36-41

Two cryoproteins (CP I and CP II) from the peanut (*Arachis hypogaea* L.) seed were isolated following the fractionation of a 2M NaCl, 0.01 M Tris-HCl (pH 7.5), and 0.002% sodium azide protein extract on a Sephacryl S-300 column. The cryoproteins I and II had molecular weights of 500000 and 380000 $\pm$ 20000, respectively. The protein composition of the cryoproteins was found to be different after ion-exchange chromatography and gel electrophoresis. Addition of 2-mercaptoethanol did not alter the molecular weights and electrophoretic patterns of the cryoproteins. Amino acid compositions of the cryoproteins I and II were similar. The critical temperature for cryoprecipitation was between 2 and 15 C. Cryoprecipitation increased with increasing protein concentration and reached a maximum at 40 mg/mL. Cryoprotein I showed higher cryoprecipitation with lower protein concentration compared to the cryoprotein II. Maximum cryoprecipitation was obtained around pH 7.5 and at an ionic concentration of 0.4 M (CP I) and 0.2 M (CP II). Limited protease treatment, although it destroyed the cryoprecipitation property, did not cause a major change in the molecular weights of the cryoproteins. AA

CASHEW

- 133 FALADE (JA). Varietal differences in tree size and yield of cashew (*Anacardium occidentale* L.) in Nigeria. J. Plant. Crops. 9(2); 1981; 77-83
- 134 PILLAI (SP) and MUTHU (M). A study on the bionomics of major insect species infesting cashew kernels. J. Food Sci. Technol. (India) 19(3); 1982; 118-20

In a survey conducted at the major cashew processing units, *Tribolium castaneum*, *Euphestia cautella*, and *O. surinamensis* were identified as the major insect pests of processed cashew kernels. Laboratory investigation on five species of insects showed that *T. castaneum* had a low population growth rate as measured by 'intrinsic rate of natural increase per week and 'theoretical rate of self multiplication'. However, *T. castaneum* was the most predominant and was successfully growing under the ecological conditions prevalent in the cashew processing units. Though the temperature and humidity conditions prevailing at the processing units were conducive to the faster multiplication of the moth species, the interspecific competition and probably, ecological adaptability of *T. castaneum* will continue to make it the most important pest infesting processed cashew kernels. AA

COCONUT

- 135 BABOO (B). Development of manually operated coconut dehusker. J. Plant Crops. 9(2); 1981; 95-9
An improved model of a coconut dehusker first developed in U.K. in 1960's and subsequently modified by the research workers in India during 1970's has been described. This simple device can dehusk coconut of any shape and size. The observed breakage of nuts is about 1%. Two unskilled workers can dehusk about 1600 nuts in 8 hours. AA
- 136 SHYAMAL ROY. Coconut oil situation in India. Analysis of trends and prospects. Agric. Situation India 37(2); 1982; 85-91

SOYABEAN

- 137 MAKKAR (HPS), SHARMA (OP) and NEGI (SS). A method for measuring the firmness of cooked soyabean (*Glycine max*). J. Food Sci. Technol. (India) 19(3); 1982; 104-6
A simple apparatus which can be fabricated in laboratory has been developed and diagrammatically shown which is useful for measuring the firmness of cooked soyabean. The instrument measures the force required to cut the sample; using the instrument it has been theoretically proved also. Firmness of 3 varieties of soyabean has been compared after cooking for 5, 15 and 25 minutes and the firmness ratio has been arrived at. AA
- 138 HU (B) and ESEN (A). Heterogeneity of soyabean proteins: Two-dimensional electrophoretic maps of three solubility fractions. J. Agric. Food Chem. 30(1); 1982; 21-5
- 139 FRIEDRICH (J) and LIST (GR). Characterization of soyabean oil extracted by supercritical carbon dioxide and hexane. J. Agric. Food Chem. 30(1); 1982; 192-3
Exhaustive extraction of full-fat soyabean flakes with supercritical carbon dioxide (SC-CO₂) yields an oil that is comparable to hexane-extracted oil except for significantly lower chromatographic refining loss and phosphorus content. In a long cylindrical batch extractor, the flakes act much like the stationary phase of a chromatography column, which permits the recovery of light-coloured, essentially degummed, crude oil fractions. AA
- 140 LAKSHMINARAYANA (T), AZEEMODDIN (G), ATCHYUTA RAMAYYA (D) and THIRUMALA RAO (SD). Effect of degumming on keeping quality and refinability of indigenous soyabean oil. J. Food Sci. Technol. (India). 19(3); 1982; 126-7
Crude soyabean (indigenous black soyabean called Kalithur) was degummed for 30-45 minutes with 5% water at 75 C. Crude and degummed oil were stored in closed tin containers and were examined at 30 day

intervals for 360 days. Variation in free fatty acid, iodine value and Lovibond colour are not significant during the storage period, but based on the peroxide value the degummed oil could be stored to 120 days; crude oil for 210 days. Storage did not affect the refinability of the oil. AA

COTTONSEED

- 141 CLARK (SP). Quality of oil from acid delinted cottonseed. J. Am. Oil Chem. Soc. 57(11); 1980; 376-9
Oils were extracted experimentally by direct solvent and prepress solvent processes from saw delinted cottonseed as well as from some of the same seed delinted with dilute sulphuric acid. Oils were refined, bleached and deodorized. Deodorized oils were stored in an air oven at 60 C for 30-35 days. Approximately twice a week, stored samples were analyzed for peroxide value. No significant differences in rate of increase of peroxide value were found among the oils. AA

RAPSEED

- 142 DAUN (JK) and BIELY (J). Variation in protein and oil content of whole rapeseed exported from Canada. J. Am. Oil Chem. Soc. 57(11); 1980; 380
Protein content of rapeseed exported from Canada was found to be $37.2 \pm 0.89\%$, and the oil content $41.3\% \pm 0.73\%$, both on an 8.5% moisture basis. KMD
- 143 EL AZZABI (TS), CLARKE (JH) and HILL (ST). Lipolytic activity of fungi on rapeseed oil. J. Sci. Food Agric. 32(5); 1981; 493-7
Of the 18 species of fungi tested only *Aspergillus versicolor* showed no lipolytic activity. The results suggest that many fungi can cause lipolysis of rapeseed oil, but there are great differences in the lipolytic activity between species. KAR
- 144 GARG (SK), SHARMA (AK), SINGH (L) and UPPAL(JS). Biochemical effects of rapeseed meal in albino rats. J. Food Sci. Technol. (India) 19(3); 1982; 121-2
A 4 week trial was conducted with male albino rats to ascertain the effect of different protein levels of rape seed meal (RMS) on growth rate and changes in carbohydrate and protein metabolism in various tissues. The levels of muscle aminotransferases increased, whereas liver glycogen decreased significantly in RSM (10%) fed animals as compared to casein fed animals. The other biochemical parameters examined remained unaltered. The animals fed RSM at 5% level showed an increase in liver glycogen content while blood glucose, protein of both liver and muscle as well as aminotransferases of muscles decreased significantly in comparison with group fed 10% RSM. However, the muscle glycogen and liver aminotransferases did not vary significantly in both RSM fed animals. Furthermore, significant decrease was also observed in growth rate of both RMS groups. Thus, it is suggestive that RMS intake disturbs the metabolic homeostasis and cannot be recommended as such for animal consumption. AA

SESAME SEED

- 145 RIVAS (NR), DENCH (JE) and CAYGILL (JC). Nitrogen extractability of sesame (*Sesamum indicum* L.) seed and the preparation of two protein isolates. J. Sci. Food Agric. 32(6); 1981; 565-71
Nitrogen extractability from sesame flour in water is greatest using a flour to solvent ratio of 1:40 with an extraction time of 15 minutes.

Maximum extraction (>90%) was found at pH 11.00. The alkali isolate (extracted in water at pH 10.0 and precipitated at pH 4.0) was readily solubilized and showed a good protein recovery (60%). The salt isolate (extracted in 1M NaCl at pH 6.0 and precipitated at pH 4.0) was less soluble and showed a lower protein recovery (50%). The amino acid composition of the sesame products is described. Oil expelled cake showed poor nitrogen extractability (53% at pH 11.0 in water). KAR

TUBERS AND VEGETABLES

- 146 ANDREWS (W). The genetic engineering of vegetables.
Food Manuf. 56(9); 1981; 28-9
Discusses: carrots for canning; gene bank; and testing potatoes. BSN

POTATO

- 147 KAHN (AS) and CHANDRA (R). Price policy for perishable agricultural commodities with special reference to potatoes and onions.
Agric. Situation India. 36(12); 1982; 867-73
- 148 BRISTOL (DW), COOK (LW), KOTERBA (MT) and NELSON (DC). Determination of free and hydrolyzable residues of 2,4-dichlorophenoxyacetic acid and 2,4-dichlorophenol in potatoes.
J. Agric. Food Chem. 30(1); 1982; 137-44
Free and trace residues (hydrolyzable forms) of both 2,4-Dichlorophenoxyacetic acid and 2,4-Dichlorophenol in potatoes were estimated separately as follows: free residues were extracted with an acidified mixture of ethyl and petroleum ethers, or after hydrolysis, extraction of free plus acid hydrolyzable forms with benzene, partitioning cleanup into alkali and then after acidification into ethyl ether; separation of 2,4-DCP from 2,4-D on an acidic column; methylation of 2,4-D and quantification by GLC. 2,4-D residues averaged 0.11 ppm, whereas 2,4-DCP residues were less than 10% of the former. In the conjugated form, at least 18% of total 2,4-D was found. As a result of simulated storage, 2,4-D dissipated from whole potatoes with a half-life of about 12 weeks. Peel of potatoes did not act as a centre of concentration of residues. Baking did not exert any influence on presence of residues. BSN

- 149 LANCASTER (PA), INGRAM (JS), LIM (MY) and COURSEY (DG). Traditional cassava-based foods: Survey of processing techniques.
Econ. Bot. 36(1); 1982; 12-45
Article covers description of the plant, its origin and distribution, problem of toxicity, nutritive value of cassava and its products, traditional cassava processing techniques in tropical America, Africa, and Asia are separately described. KAR

CABBAGE

- 150 SRISANGNAM (C), REDDY (NR), SALUNKHE (DK) and DULL (GG). Quality of cabbage. Part III. Effects of blanching on the nutritional quality of cabbage (*Brassica oleracea* L.) proteins.
J. Food Quality 3(4); 1980; 251-9
Cabbage was blanched in solution or vacuum impregnated in a solution followed by steam blanching. Steam blanching led to loss of cysteine, but not by solution blanching. *In vitro* availability of amino acids indicated that the predicted biological value and chemical score for the available amino acids were decreased after blanching. Availability of S-amino acids increased by blanching in solution. There was change in electrophoretic pattern of proteins also. KAR

FRUITS

- 151 ANON. Progress in the field of fruit and vegetable juices.
Flussiges Obst. 47(5); 1980; 196-203 (German)

STRAWBERRY

- 152 WHEELER (WB), THOMPSON (NP), EDELSTEIN (RL) and KRAUSE (RT). Degradation of methomyl residues in frozen strawberries.
J. Assoc. Off. Anal. Chem. 64(5); 1981; 1211-5

GRAPE

- 153 MORRIS (JR) and CAWTHON (DL). Effects of ethephon on maturation and post harvest quality of 'Concord' grapes.
J. Am. Soc. Hort. Sci. 106(3); 1981; 293-5
Single and split applications of (2-chloroethyl) phosphonic acid (ethephon) at different concentrations to 'Concord' grapes (*Vitis labrusca* L.) did not influence maturation. When ethephon was applied 8 days prior to harvest, abscission was enhanced and postharvest alcohol accumulation was reduced when fruit was shaken from the vine and held at 30 C for up to 24 hours. AA
- 154 BENCIVENGA (B), PALLOTTI (G), SIMONETTI (T), DeVINCENZI (S) and PASQUAZI (G). Pesticide residues in table grapes cultivated near Rome.
Ind. Aliment. 19(178); 1980; 936-8 (Italian)
Table grapes of the "Italia" variety, cultivated extensively around Rome in 1978, were found to have pesticide residues well below the legally permissible limits. KMD

BANANA

- 155 TODA (H), YAMAGUCHI (K) and SHIBAMOTO (T). Isolation and identification of banana-like aroma from banana shrub (*Michellia figo spreng*).
J. Agric. Food Chem. 30(1); 1982; 81-4

PLUM

- 156 ISMAIL (HM), WILLIAMS (AA) and TUCKNOTT (OG). The flavour of plums (*Prunus domestica* L.). An examination of the aroma components of plum juice from the cultivar Victoria.
J. Sci. Food Agric. 32(6); 1981; 613-9
73 volatile compounds were identified in juices from Victoria plums; of these benzaldehyde, linalool, ethyl nonanoate, methyl cinnamate, and γ -decalactone contribute to plum aroma. Milling the plums increased the concentration of hexanol and *cis* 3-hexenol and also produced hexenal and *trans*-hexenal - these contribute to green aroma of juice. KAR

APPLE

- 157 KNEE (M) and HATFIELD (SGS). The metabolism of alcohols by apple fruit tissue.
J. Sci. Food Agric. 32(6); 1981; 593-600
The interconversion of short chain aliphatic alcohols, aldehydes and esters of apple fruit has been studied by GLC of the products, when substrates were supplied as vapours to fruit slices at 20 C and to whole fruit during storage at 3 C. After different periods of storage, cortical

tissue slices formed corresponding aldehydes and acetate esters from alcohols; esterification was more rapid with higher alcohols. Esterification by peel tissue slices was more rapid initially, but quickly declined. Both cortex and peel tissue were capable of acetylating butanol and 2-methyl propanol at all stages of maturity, from the preclimacteric state at normal harvest time, when endogenous ester levels were low, through 58 days ripening at 12 C. KAR

- 158 WILKES (PS). Gas-liquid chromatographic-mass spectrometric confirmation of endosulfan and endosulfan sulphate in apples and carrots. J. Assoc. Off. Anal. Chem. 64(5); 1981; 1208-10

- 159 MACGREGOR (DR) and KITSON (JA). Use of vacuum in apple processing: A review. Food Technol. Aust. 33(11); 1981; 570-71, 573

Vacuum treatment of apples for solid pack results in improved yield and quality. Continuous vacuum treatment has the additional advantage over the batch process of continuity and lower capital, labour and power costs. Commercial, continuous - vacuum equipment has now been operating successfully for several years. KAR

- 160 AMOS (G), BUTZ (M) and RENNSTICH (E). The technique of cold extraction by means of the band extractor, carried out with apples. Flussiges Obst. 47(5); 1980; 213-8 (German)

The cold extraction of apple juices by means of the band extractor has been described. The band extractor comprises the container for stocking residues (it also acts as a buffer container), 10 extraction stages, collecting tank and overflow pipes. By this method, a yield of 92.35% is attained. The advantage of this system is that the available system of presses can be reused. A higher percentage of direct juice (78.10%) is obtained. The problems arising in the apparatus can easily be attended to, since the plant does not have any complicated structure. VR

- 161 TANDON (RC) and SINGH (JB). Woven veneer box for apples. Perfectpac. 22(4); 1982; 5-11

The woven veneer box has been proposed as a substitute for the conventional wooden box used for the packaging and transportation of apples in Himachal Pradesh (N. India). It is 10% cheaper and requires 40% less of wood for its manufacture. The method of manufacture has been described, and the results of various strength tests reported. KMD

SUGAR, STARCH AND CONFECTIONERY

- 162 KEARSLEY (MW), SATTI (SH) and TREGASKIS (I). The production and properties of glucose syrups. I. Production of glucose syrups by enzymatic hydrolysis of starch. Starch. 32(5); 1980; 169-74

Certain metal ions are shown to influence the enzymic hydrolysis of maize starch. Amyloglucosidase was not affected by the metal ions, but α - and β -amylase were affected by varying degrees. Calcium ions produced a positive effect with both fungal and bacterial α -amylases; but had no effect with β -amylase, whilst zinc, ferric and lead ions produced negative effects or no effect. A simultaneous enzymic hydrolysis (using α - and β -amylases) and catalytic hydrogenation showed enzyme inhibition by the nickel catalyst. High hydrogen pressure (100 at) had little effect on the enzymes. The hydrolysis and hydrogenation of the starch fraction of milled whole defatted maize was also shown to be feasible. AA

- 163 HELWIIG-NIELSEN (B). Production of fructose-containing syrup with enzymes. Int. Sugar J. 83(992); 1981; 227-31

- 164 DAVIES (T), MILLER (DC) and PROCTER (AA). Inclusion complexes of free fatty acids with amylose. Starch. 32(5); 1980; 149-58
- 165 SZEJTLI (J), LIPTAK (A), JODAL (I), FUEGEDI (P), NANASI (P) and NESZMELYI (A). Synthesis and ^{13}C -NMR spectroscopy of methylated beta-cyclodextrins. Starch. 32(5); 1980; 165-9
- 166 ALBERT (R), STRATZ (A) and VOLLHEIM (G). Catalytic production of sugar alcohols (polyols) and their application. Chemie-Ingenieur-Technik. 52(7); 1980; 582-7 (German)
- 167 BOERINGER (HR) and MOERMANN (JE). Automatic determination of reducing carbohydrates. Starch. 32(5); 1980; 174-5
- The present paper describes a quick, simple and reproducible automatic optical determination technique for detection of microgram amounts of reducing carbohydrates, which react with acid hydrazides in alkaline solution to form yellow anions. AA

CHOCOLATE

- 168 HEEMSKERK (MFM). Chocolate spreads: Formulation and technology. Manuf. Confect. 61(8); 1981; 40-44
- 169 PANGBORN (RM) and KOYASAKO (A). Time-course of viscosity, sweetness and flavour in chocolate desserts. J. Texture Stud. 12(2); 1981; 141-50
- Using a strip-chart recorder to monitor time, intensities of oral viscosity, sweetness, and chocolate flavour were evaluated for two chocolate desserts - canned pudding and a canned creme - identical in formula except for the thickening agent. The time-intensity (T-I) curves provided four major sets of information for interpretation of findings: (1) maximum sensory intensity; (2) time required to reach maximum; (3) total duration of sensation, and (4) total area under the curve. Maximum oral viscosity was perceived 8.6s after placement of the 5 g sample into the mouth, maximum sweetness after 11.1 s, and maximum chocolate flavour after 12.9 s. The pudding had significantly greater oral viscosity than the creme, but the two products had similar time patterns for flavour. Sweetness and flavour persisted long after viscosity was no longer detectable. Although there was considerable between-judge variation in the type of T-I curves generated, within-judge responses were reproducible as was the panel as a group. The usefulness of information on the time course of textural and flavour characteristics of foods and model systems during oral manipulation and swallowing is discussed. AA

BAKERY PRODUCTS

BREAD

- 170 AITROGGE (L), SEIBEL (W) and STEPHAN (H). Enrichment of different types of bread and rolls with dietary fibre. Getreide Mehl Brot. 34(9); 1980; 243-7 (German)
- The uptake of dietary fibre in human beings can be increased by enriching breads (especially wheat meal bread, wheat mixed bread and rye whole meal bread) with dietary fibre. No special technological difficulties arise during the production. These products can also be produced from appropriate, ready-to-use meals. KMD

BISCUIT

- 171 RAINS (DM) and HOLDER (JW). Ethylene dibromide residues in biscuits and commercial flour.
J. Assoc. Off. Anal. Chem. 64(5); 1981; 1252-4
 Flour and biscuit samples from a school lunch program were analyzed for ethylene dibromide (EDB). Flour samples were extracted with hexane at room temperature with maximum extraction of EDB in 4 days. Biscuits were extracted by steam distillation with hexane; optimum recoveries were obtained by a triple extraction of the sample. Recoveries of EDB from flour and biscuits ranged from 85 to 103% as determined by gas-liquid chromatography on a 15% OV-17 column and a ^{63}Ni electron capture detector. Random samples were confirmed by gas chromatography-mass spectrometry. From <9 ppb to 4 ppm EDB were determined in flour and <0.5 ppb to 260 ppb in biscuits. Possible sources for the higher values are discussed. AA

MILK AND DAIRY PRODUCTS

- 172 GREENBERG (NA) and MAHONEY (RR). Immobilisation of lactase (β -Galactosidase) for use in dairy processing: A review.
Process. Biochem. 16(2); 1981; 2-8, 49
 Discusses: lactase; immobilisation and its methods; immobilisation of fungal lactase, yeast lactase and bacterial lactase; and economic considerations. BSN
- 173 PANTULU (PC), UNNIKRISHNAN (V) and RAMA MURTHY (MK). A study of seliwanoff colour reaction for estimation of sucrose in dairy products.
J. Food Sci. Technol. (India) 19(3); 1982; 113-5
 Absorption spectra of resorcinol colour complex during heating at high temperature (>60 C) showed that absorbance at 490 nm gives better reproducibility of results and this was selected for further study. Test solutions (see *J. Food Sci. Technol.* 13, 1976, 157) were also heated at 60, 70, 80, 90 C and in boiling water bath for 10 to 60 minutes and the optimum absorbance was found to be in those heated at 70 C for 40 minutes. Pure sucrose and lactose solutions as well as their 1:2 mixture when heated at 70 C and in boiling water bath showed no influence of lactose at 70 C and 60 minutes heating; however, at higher than this temperature, lactose influenced the colour. Estimation of sucrose in ice cream and condensed milk by heating at 70 C for 40 minutes or 15 minutes in boiling water bath gave results comparable to those obtained by standard volumetric method. AA
- 174 THRASHER (B) and RICHARDSON (GH). Comparative study of the stomacher and the waring blender for homogenization of high-fat dairy foods.
J. Food Prot. 43(10); 1980; 763-4
 There were no differences between conventional aerobic plate counts on high-fat dairy food products after homogenization 2 minutes in either a Stomacher 400 or a Semi-Micro Waring blender. AA

MILK

- 175 MATHUR (GK), MALIK (CL) and SINGH (SP). Milk production estimates in India for the years 1977-78, 1978-79 and 1979-80.
Agric. Situation India 36(11); 1982; 803-8
- 176 PATEL (RK), SINGH (RV), SAINI (AS) and NAGPAL (RC). Energy input and cost of milk production.
Agric. Situation India 36(11); 1982; 791-6

- 177 GURR (MI). Review of the progress of dairy science: Human and artificial milks for infant feeding.
J. Dairy Res. 48(3); 1981; 519-54
- 178 GREEN (WC) and PARK (KK). Comparison of AOAC, microwave and vacuum oven methods for determining total solids in milk.
J. Food Prot. 43(10); 1980; 782-3
- 179 PIERRE (A) and BRULE (G). Mineral and protein equilibria between the colloidal and soluble phases of milk at low temperature.
J. Dairy Res. 48(3); 1981; 417-28
- 180 SHIOYA (T), KAKO (M), TANEYA (S) and SONE (T). Influence of time thickening on the whippability of creams.
J. Texture Stud. 12(2); 1981; 185-200
Flow properties of creams containing milk fat (Cream A), vegetable fat (Cream C), and vegetable fat plus milk fat (Cream B) were determined with a coaxial cylinder viscometer for a wide range of shear rates. All creams examined showed time thickening. The viscosity increase with shearing time was expressed by two stage equations as follows:
- $$\ln (\eta_t/\eta_0) = K_1 t + C_1 \quad (1)$$
- $$\ln (\eta_t/\eta_0 - \exp (K_1 t)) = K_2 t + C_2 \quad (2)$$
- where η_0 and η_t are cream viscosity at zero and t shearing time, K_1 and K_2 are rate constants and C_1 and C_2 are constants. The first stage (Eq.1) was assumed to occur in the course of primary clustering of the independent fat globules, and the second stage (Eq. 2) was assumed to occur in the course of coagulation of the fat globule clusters. Both K_1 and K_2 increased as shear rate increased. At the same time, the whippability of each cream was determined with a household mixer to which was attached a strain gauge transducer unit for measuring consistency of the whipped creams. There was a tendency for a higher ratio of milk fat/vegetable fat in the creams to decrease the whipping time or to increase whippability of the creams. Correlations of stability, whippability, and flow properties were examined. A cream which was high stability showed a low K_1 value, and a cream which has high whippability showed a high K_2 value. K_1 and K_2 values at a suitable shear rate will be quite helpful in the determination of the physical properties of cream. AA
- 181 BARRY (JG) and DONNELLY (WJ). Casein compositional studies. II. The effect of secretory disturbance on casein composition in freshly drawn and aged bovine milks.
J. Dairy Res. 48(3); 1981; 437-46
- 182 CHOBERT (J-M), ADDEO (F) and RIBADEAU DUMAS (B). Isolation of K-casein-like fractions from human whole casein by chromatography on thiol - sepharose, hydroxyapatite and DEAE - cellulose.
J. Dairy Res. 48(3); 1981; 429-36
- 183 COGAN (U), MOSHE (M) and MOKADY (S). Debittering and nutritional upgrading of enzymic casein hydrolysates.
J. Sci. Food Agric. 32(5); 1981; 459-66
Casein hydrolysates prepared by commercial proteolytic enzymes could be debittered using activated carbon. But this resulted in the loss of tryptophan (63%), phenylalanine (36%) and arginine (30%). However, the nutritional quality could be improved by supplementing tryptophan and phenylalanine. KAR
- 184 HORNE (DS) and PARKER (TG). Factors affecting the ethanol stability of bovine milk. IV. Effect of forewarming.
J. Dairy Res. 48(3); 1981; 405-15

- 185 BLESÁ (O), ELLENRIEDER (G), GERONAZZO (H) and MACORITTO (A). Cow-milk and soya milk mixtures. Studies on their acceptability and elimination of anti-nutritive factors.
An. Bromatol. 32(4); 1980; 327-36 (Spanish)
A mixture of 40% soya milk and 60% cow milk was "liked moderately" by a panel of 64 untrained persons. The thermal inactivation of trypsin inhibitor was accelerated by the presence of cow-milk. When cow milk is used instead of water in soya milk preparation, the inactivation time necessary to obtain the same, residual trypsin inhibitor activity was reduced by approximately one half. The biological values of the mixtures of these milks (75.5-77.5) are nearer to that of cow milk (80) than B.V. of pure soya-milk (66.4). KMD
- 186 SHELDRAKE (RF), HOARE (RJT) and WOODHOUSE (VE). Relationship of somatic cell count and cell volume analysis of goat's milk to intramammary infection with coagulase-negative staphylococci.
J. Dairy Res. 48(3); 1981; 393-403
- 187 ITO (Y), TOYODA (M), SUZUKI (H), OGAWA (S) and IWAIDA (A). Gas-liquid chromatographic determination of butylated hydroxytoluene in modified powdered milk.
J. Food Prot. 43(11); 1980; 832-3
A method to determine butylated hydroxytoluene (BHT) in powdered milk was first established, and then used to measure BHT in modified powdered milk manufactured in Japan for infants. The amounts of BHT measured towards the end of 1977 were 0.25-0.40 ppm. Throughout 1978, a campaign was carried out to avoid contact with plastics during production and manufacture; results were fruitful, and the products examined in the first half of 1979 were quite free of BHT. KMD
- 188 HOLADAY (CE). Rapid screening method for aflatoxin M₁ in milk.
J. Assoc. Off. Anal. Chem. 64(5); 1981; 1064-6
- 189 TRUCKSESS (MW) and STOLOFF (L). High performance liquid chromatographic determination of aflatoxicol in milk, blood, and liver.
J. Assoc. Off. Anal. Chem. 64(5); 1981; 1083-87
- 190 MIKOLAJCIK (EM) and RAJKOWSKI (KT). Simple technique to determine heat resistance of *Bacillus Stearothermophilus* spores in fluid systems.
J. Food Prot. 43(10); 1980; 799-804
- 191 APPUSWAMY (S), BATISH (VK), OM PRAKASH and RANGANATHAN (B). Prevalence of mycobacteria in raw milk sampled in Karnal, India.
J. Food Prot. 43(10); 1980; 778-81
A total of 308 raw milk samples, 209 from an organized farm and 99 from a market source, were examined for the presence of mycobacteria. Mycobacteria were recovered from 4.3% of the farm samples and from 5.1% of the market samples. The isolated cultures identified on the basis of morphological and physiological characteristics and virulence included *Mycobacterium tuberculosis* (bovine and human strains), *M. phlei*, *M. kansasii*, *M. fortuitum*, *M. aquae* and *M. intracellulare*. The significance of presence of even a few virulent strains of mycobacteria in raw milk is discussed. AA
- 192 SADOVSKI (AY), GORDIN (S) and FOREMAN (I). Psychrotrophic growth of microorganisms in a cultured milk product.
J. Food Prot. 43(10); 1980; 765-8
- 193 SALOOJA (MK) and BALACHANDRAN (R). Studies on the production of kulfi. Part I. The acceptable level of total milk solids.
J. Food Sci. Technol. (India) 19(3); 1982; 116-8
Attempts were made to standardise the Kulfi a frozen milk product similar to ice cream prepared in India. As there is no standardised method for the preparation of Kulfi on commercial scale, attempts were made to prepare Kulfi from milk having different milk solids content.

Concentrated cow milk having solids content of 17,20,23,26 and 29% were used and the sugar added was 13%. It was found that use of milk with 26% total solids content gives Kulfi with better body, texture and overall acceptability as evaluated by a panel of judges. AA

YOGURT

- 194 ABRAHAMSEN (RK) and HOLMEN (TB). Goat's milk yoghurt made from non-homogenized and homogenized milks, concentrated by different methods. *J. Dairy Res.* 48(3); 1981; 457-63
- Quality characteristics of goat's milk yoghurt made from homogenized and non-homogenized concentrates prepared by vacuum evaporation, addition of dried skimmed goat's milk, reverse osmosis or ultrafiltration were observed. Yoghurts made from ultrafiltered milk gave the best flavour and viscosity, whilst homogenization of the concentrates also increased these qualities. Cow's milk yoghurts prepared in the same way were improved to an even greater extent by homogenization. Stirred goat's milk yoghurt had too low a viscosity to be acceptable, unless made from homogenized ultrafiltered milk. AA

WHEY

- 195 MACRIS (BJ) and MARKAKIS (P). Characterization of extracellular β -D galactosidase from *Fusarium moniliforme* grown in whey. *Appl. Environ. Microbiol.* 41(4); 1981; 956-8

CHEESE

- 196 DEMOTT (BJ) and SANDERS (OG). Whey protein use in cottage cheese dressing. *J. Food Prot.* 43(10); 1980; 752
- 197 ASTON (JW) and DOUGLAS (K). Detection of carbonyl sulphide in cheddar cheese headspace. *J. Dairy Res.* 48(3); 1981; 473-8
- Carbonyl sulphide (COS) was detected in the headspace of Cheddar cheeses in concentrations ranging from 0.01 ng ml⁻¹ to 0.3 ng ml⁻¹. It was also found in the headspace above certain packaging materials and sealing materials used in the analytical procedures. Evidence that COS was produced within the cheese was given by the findings that experimental cheese containing added cysteine had consistently higher COS levels (up to 1.0 ng ml⁻¹) and that COS could be produced chemically from mixtures of cysteine or methionine with riboflavin and ascorbic acid in laboratory trials. AA
- 198 LE BARS (D) and GRIPON (J-C). Role of *Penicillium roqueforti* proteinases during blue cheese ripening. *J. Dairy Res.* 48(3); 1981; 479-87
- 199 ANIFANTAKIS (EM), VEINOGLIOU (BC) and KANDARAKIS (JG). Manufacture of gruyere-type cheese with 50:50 rennet/swine pepsin. *J. Dairy Res.* 48(3); 1981; 513-8
- 200 SALIH (MA) and SANDINE (WE). Lactic streptococcal agglutinins: A review. *J. Food Prot.* 43(11); 1980; 856-8
- Agglutinins that cause clumping and settling of lactic streptococci are reviewed. Evidence defining the role played by agglutinins in sedimentation defects occurring during cottage cheese manufacture is presented. The needs for a fast, simple and reliable agglutination test, and additional research on the influence of agglutinins on other fermented milk products, are noted. AA

ICE CREAM

- 201 BRUHN (JC), PECORE (S) and FRANKE (AA). Measuring protein in frozen dairy desserts by dye binding.
J. Food Prot. 43(10); 1980; 753-5

MEAT AND POULTRY

- 202 KLEWITZ (H). Operative technique for slaughtering of small animals.
Fleisch. 33(8); 1979; 142-3 (German)
- 203 LANGHOFF (L). Drawing-off, collection, drying of slaughter-house blood for human consumption.
Ind. Aliment. 19(178); 1980; 922-6 (Italian)
- 204 RUNGE (H). Experience and results of getting all byproducts of the animals for slaughter.
Fleisch. 33(8); 1979; 146-7 (German)
- 205 ETHERINGTON (DJ) and SIMS (TJ). Detection and estimation of collagen.
J. Sci. Food Agric. 32(6); 1981; 539-46
Methods are given for the detection and estimation of collagen from different tissues based on appropriate chemical, physical, histochemical and immunological techniques. KAR
- 206 CORTESI (ML). Valuations about the possibility of extending the shelf-life of cooked hams.
Ind. Aliment. 19(178); 1980; 909-12 (Italian)
Heat treatment after packaging seems at the moment the best method to extend the shelf-life of cooked hams without resorting to other treatments, such as chemical substances and UV rays before packaging. AA
- 207 STILES (ME) and NG (L-K). *Enterobacteriaceae* associated with meats and meat handling.
Appl. Environ. Microbiol. 41(4); 1981; 867-72
The source of *Enterobacteriaceae* on meats was shown to be associated with the meat-handling work surfaces in the two packing plants studied. A total of 2,343 *Enterobacteriaceae* were isolated and identified from meat samples and work surfaces at the packing plants and at the retail facilities. *Escherichia coli* biotype I and *Serratia liquefaciens* were detected at all stages of meat handling, indicating that they may be present in meats throughout the meat-handling system. *Enterobacter agglomerans* and *S. liquefaciens* were the predominant *Enterobacteriaceae* at the retail level, but they had limited indicator potential for sanitation and hygiene. *Klebsiella pneumoniae* was a frequent isolate among *Enterobacteriaceae* from meats and meat-handling surfaces in the packing plants but not at the retail level, indicating that this organism might signal unhygienic handling of meats at the retail level. AA
- 208 BENEDICT (RC). Biochemical basis for nitrite-inhibition of *Clostridium botulinum* in cured meat.
J. Food Prot. 43(11); 1980; 877-91
Inhibition of *C. botulinum* by nitrite in cured meats is most likely due to several interacting mechanisms: (a) reaction and oxidation of cellular biochemicals within the spores and vegetative cells; (b) restriction of use of iron (or other essential metal ions) through inhibition of solubilization, transport, or assimilation, thus interfering with metabolism and repair mechanisms and (c) cell surface membrane activity limiting substrate transport by the outgrowing cell. AA

- 209 DRAUGHON (FA), MELTON (CC) and MAXEDON (D). Microbial profiles of country-cured hams aged in stockinettes, barrier bags and paraffin wax. Appl. Environ. Microbiol. 41(4); 1981; 1078-80
- 210 SUMNER (JL), GORCZYCA (E) and LIM (KB). The hygienic status of minced meat purchased in Melbourne. Food Technol. Aust. 33(9); 1981; 416-8
In a survey of 150 samples, lower total counts were obtained in samples from the Victoria Market, compared with samples from retail butcher shops or from supermarkets. Counts were higher in minced meat surveyed in summer compared with those purchased in winter. Mean product temperatures at time of purchase ranged from 6.5 C - 8.5 C in winter and from 9.3 - 12.1 C in summer. Sulphur dioxide which was prohibited by regulation was found at levels of up to 750 mg/kg meat in 50% of Victoria Market, 35% of retail shops and 10% of supermarket samples. KAR
- 211 CASERIO (G) and PATANO (C). Bacteriological and chemical researches about some sausages on sales in Italy. Ind. Aliment. 19(178); 1980; 939-43 (Italian)
- 212 ANON. New range of meat snacks. Food Eng. Int. 6(8); 1981; 47-8, 51

BEEF

- 213 BOND (MP). Progress with beef carcass classification. Food Technol. Aust. 33(9); 1981; 438-40
- 214 McKEITH (FK), SMITH (CG), DUTSON (TR), SAVELL (JW), HOSTETLER (RL) and CARPENTER (ZL). Electrical stimulation of intact or split steer or cow carcasses. J. Food Prot. 43(10); 1980; 795-8
- 215 ROBBINS (FM) and WALKER (JE) Jr. Separation of catheptic enzymes of bovine spleen by isoelectric focussing. J. Agric. Food Chem. 30(1); 1982; 61-5
- 216 LEDWARD (DA), LYMN (SK) and MITCHELL (JR). Textural changes in intermediate moisture meat during storage at 38 C. J. Texture Stud. 12(2); 1981; 173-84
Intermediate moisture beef prepared by cook-soak equilibration, with glycerol and sodium chloride as humectants, was stored at 38 C under both anaerobic and aerobic conditions for up to 12 weeks. Meat texture was measured by Warner-Bratzler, tensile and objective texture profile methods. Covalent crosslink formation was monitored by solubility measurements in solutions of sodium dodecyl sulphate plus- β -mercapto-ethanol. A decrease in the Warner-Bratzler peak height on storage was observed though this did not depend strongly on the storage environment. In contrast, the large decrease observed in the tensile force required to rupture the meat when pulling perpendicular to the fibre direction was greater for aerobically stored meat. The cohesiveness and 'elasticity' of the meat as determined by objective texture profile measurements showed an initial decrease followed by a subsequent increase, but a similar increase was not shown by the hardness parameter. The results are discussed in terms of the crosslinking and degradative reactions known to occur in meat of this type. AA
- 217 HANNA (MO), HALL (LC), SMITH (GC) and VANDERZANT (C). Inoculation of beef steaks with *Lactobacillus* species before vacuum packaging. I. Microbiological considerations. J. Food Prot. 43(11); 1980; 837-41

- 218 ANDERSSON (Y) and LUNDGREN (B). Sensory texture/consistency descriptors for beef patties containing protein products. *J. Texture Stud.* 12(2); 1981; 217-41
- 219 BUTLER (JL), SMITH (GC), SAVELL (JW) and VANDERZANT (C). Bacterial growth in ground beef prepared from electrically stimulated and nonstimulated muscles. *Appl. Environ. Microbiol.* 41(4); 1981; 915-8
- 220 SMITH (GC), HALL (LC) and VANDERZANT (C). Inoculation of beef steaks with *Lactobacillus* species before vacuum packaging. II. Effect on meat quality characteristics. *J. Food Prot.* 43(11); 1980; 842-9
- Biceps femoris steaks (n = 432) were inoculated with each of four *Lactobacillus* sp. (atypical streptobacteria and betabacteria) at a high or low level of cell concentration, vacuum-packaged, stored for up to 35 days at 1-3 C, displayed under retail conditions for 3 days and subsequently cooked for sensory panel analysis. Although there was some evidence that use of high level, rather than low level or no, inoculation with *Lactobacillus* cultures resulted in the lowest muscle surface pH and the brightest muscle colour, the least surface discolouration and the highest overall appearance ratings following storage for 0-35 days, there were negative effects which negated efficacy of high level inoculation. Negative effects of use of high level, rather than low level or no, inoculation with *Lactobacillus* cultures included the highest incidence of off-odour, the highest incidence of defects during retail display (most extensive surface discolouration, most extensive peripheral discolouration, least desirable overall appearance) and the lowest palatability (juiciness, tenderness, flavour and overall palatability) ratings. Few of the differences among steaks were statistically significant but the preponderance of evidence (largely that based on numerical differences) suggests that inoculation with the *Lactobacillus* cultures used in this study will not improve storage life, retail caselife or palatability of beef. AA

PORK

- 221 SIMON (F) and KORBER (K). New scalding process for pigs. *Fleisch.* 33(8); 1979; 144-5 (German)
- The new scalding process, also called the Berlin scalding process for pigs, has been described. The scalding of whole pigs is done at a temperature of 58 C + 1 K, which is kept constant by an automatic control device. Higher skin yield (around 300000 m² in a year), higher bristle yield, improved working conditions. Low costs, and good possibilities for further mechanization and automatisisation are some of the salient features of this process. KMD
- 222 MARRIOTT (NG), POETKER (RH), GARCIA (RA) and LEE (DR). Acceptability of accelerated-processed pork. *J. Food Prot.* 43(10); 1980; 756-9, 762
- Differences between the accelerated and the conventionally processed samples of pork were not enough to merit the preference of pork from one processing technique over the other method. AA
- 223 FURTADO (RM), PEARSON (AM), HOGBERG (MG), MILLER (ER), GRAY (JI) and AUST (SD). Withdrawal time required for clearance of aflatoxins from pig tissues. *J. Agric. Food Chem.* 30(1); 1982; 101-6

POULTRY

- 224 PANDA (PC). Research priorities in the area of poultry products technology in India. *Poult. Guide.* 18(12); 1981; 41-51

The author has reviewed the work done in India from 1960 onwards, on the development and processing of chicken and chicken products. The tasks that remain to be tackled are: (a) to find better uses for the meat of culled hens and cockerels; (b) to utilize wastes from poultry processing plants; (c) to develop techniques for industrial scale processing of barbecue chicken, tandoori chicken, and cured and smoked chicken; (d) packaging of dressed poultry; (e) improvements in sanitary conditions of dressed poultry; (f) development of procedures for the dressing of ducks and turkeys; and (g) preparation of processed products from duck and turkey meat. KMD

- 225 PARISI (E), JULINI (M) and SARACCO (M). Inspection control of poultry meat supplied for institutional catering.
Ind. Aliment. 19(178); 1980; 948-9 (Italian)

CHICKEN

- 226 COSTA (MS). Fundamental principles of broiler breeders nutrition and the design of feeding programmes.
World Poult. Sci. J. 37(3); 1981; 177-92

DUCK

- 227 REICHEL (WL), KOLBE (E) and STAFFORD (CJ). Gas-liquid chromatographic and gas-liquid chromatographic - mass spectrometric determination of fenvalerate and permethrin residues in grasshoppers and duck tissue samples.
J. Assoc. Off. Anal. Chem. 64(5); 1981; 1196-1200

QUAIL

- 228 CHOUDHARY (MK). Preparation of ready-to-cook quail.
Poult. Guide 18(12); 1981; 69-72
All the operations involved in the preparation of dressed and packaged quails, from pre-slaughter starvation to final washing and packaging of the carcass have been described in a sequence of 13 steps. KMD

TURKEY

- 229 KAGAN (A). Supplemental fats for growing turkeys: A review.
World Poult. Sci. J. 37(3); 1981; 203-10

EGG

- 230 MAGA (JA). Egg and egg product flavour.
J. Agric. Food Chem. 30(1); 1982; 9-14
Discusses: volatiles associated with whole eggs; yolk volatiles (egg white volatiles; fermented egg volatiles); dehydrated egg product flavour; feed associated flavour; absorption of extraneous odour; and influence of storage conditions. BSN
- 231 KAMEL (B), BOND (C) and DIAB (M). Egg quality as affected by storage and handling conditions.
J. Food Quality. 3(4); 1980; 261-73
Unwashed, washed and washed and oil treated eggs were stored at 5, 25, 37 and 42 C. It was concluded that under Kuwaiti conditions eggs should be oil treated directly after collection and stored at or below 25 C to extend the quality curd shelf life significantly. KAR

SEAFOODS

- 232 HACKNEY (CR), RAY (B) and SPECK (ML). Incidence of *Vibrio parahaemolyticus* in and the microbiological quality of seafood in North Carolina. J. Food Prot. 43(10); 1980; 769-73

FISH

- 233 LOZANO (G), ROS (MM), BALGUERIAS (E), HARDISSON (A), GALINDO (L) and GARCIA MONTELONGO (F). Studies on heavy metal contamination in marine fish from the Canary Islands and the Saharian Bank. I. Mercury. An. Bromatol. 32(4); 1980; 349-52 (Spanish)

The mercury levels found in 13 species of marine fish obtained from the Canary Islands and the Saharan Bank were well below the maximum level permitted for human food. KMD

- 234 BRYAN (FL). Epidemiology of foodborne diseases transmitted by fish, shellfish, and marine crustaceans in the United States, 1970-1978. J. Food Prot. 43(11); 1980; 859-76

- 235 EYLES (MJ) and WARTH (AD). Assessment of the risk of botulism from vacuum-packaged raw fish: A review. Food Technol. Aust. 33(11); 1981; 574-80

The review covers occurrence of *C. botulinum* in fish and fish products; growth of *C. botulinum* at low temperature; growth and toxin production by *C. botulinum* in vacuum-packed raw fish; toxin levels and human susceptibility; destruction of toxin by cooking and assessment of the hazard. KAR

- 236 JACKSON (GJ), BIER (JW), PAYNE (WL) and McCLURE (FD). Recovery of parasitic nematodes from fish by digestion or elution. Appl. Environ. Microbiol. 41(4); 1981; 912-4

TUNA FISH

- 237 QUAGLIA (GB) and MAIDRANO (R). Preparation of a protein concentrate from the by-products of tuna fish. Ind. Aliment. 19(178); 1980; 931-5 (Italian)

Waste products from the tuna fish industry were subjected to enzymatic hydrolysis with papain and then lyophilized. Operating conditions that would yield a fish protein concentrate conforming to the guidelines of the Protein Advisory Group were determined. The final product has a high content of nitrogen and essential aminoacids. KMD

PROTEIN FOODS

Nil

FRUIT JUICES AND BEVERAGES

- 238 VARNER (SL) and BREDER (CV). Headspace sampling and gas chromatographic determination of styrene migration from food-contact polystyrene cups into beverages and food simulants. J. Assoc. Off. Anal. Chem. 64(5); 1981; 1122-30

GRAPE JUICE

- 239 BRAVO ABAD (F) and REDONDO CUENCA (A). Alcoholic fermentation of grape juice: Influence of prefermentation treatments.
An. Bromatol. 32(4); 1980; 337-48 (Spanish)

The effects of different degrees of must filtration, and of various sulphur dioxide concentrations on the growth and fermentative activity of *Saccharomyces ellipsoideus*, have been studied. The role of different combinations of wine yeasts on the chemical characteristics of the wines have also been studied. Sulphur dioxide has a restrictive effect on cell multiplication, and hence increases the fermentative power of the yeast, and one obtains a higher yield of alcohol. If a combination of two yeasts is used the alcohol yield is higher than that obtained by the use of the lower yielding yeast alone. A combination of *Saccharomyces ludwigii* and *Saccharomyces ellipsoideus* produces less acetoin than the first-named yeast used alone. A combination of *Schizosaccharomyces pombe* and *Saccharomyces ellipsoideus* yields a wine with little or no malic acid. KMD

ORANGE JUICE

- 240 JOHNSON (RL). The reactivation of 'Exhausted' cellulose acetate gel beads used commercially for debittering orange juice.
J. Sci. Food Agric. 32(6); 1981; 608-12
- The 'exhausted' beads could be readily and economically restored to their original activity by washing with a small volume of warm water which is recycled through a small active carbon bed. KAR

TEA

- 241 SEKIYA (J), KAJIWARA (T), IMOTO (M), INOUE (S) and HATANAKA (A). Effect of lipolytic acyl hydrolase on the activity for six carbon aldehyde formation in tea chloroplasts.
J. Agric. Food Chem. 30(1); 1982; 183-5
- 242 GOSWAMI (BK). A beverage in need of an image.
Tea Coffee Trade J. 153(10); 1981; 40, 54
- 243 SAVEL (WI). Tea - the ubiquitous bantam.
Tea Coffee Trade J. 153(10); 1981; 22, 52
- 244 BROWN (RS). Packaging: Tea and coffee have unique needs.
Tea Coffee Trade J. 153(11); 1981; 14-5
- 245 TORIJA ISASA (ME) and DIAZ MARQUINA (A). Mineral elements in commercial teas. I. Macroelements.
An. Bromatol. 32(4); 1980; 361-6 (Spanish)
- Na, K, Ca and Mg have been determined in two kinds of commercial teas, green and black, and their infusions. The contents of each of these elements in the product, and in a cup of infusion, have been reported, as also the percentage of each element liberated. The element present in greatest proportion both in the tea leaves and in the infusion was potassium - 2160 mg/100 g tea leaves and 17 mg/100 g infusion. KMD
- 246 RAJUKKANNU (K), BALASUBRAMANIAN (M) and VASUDEVAN (P). Residues of dicofol and tetradifon in tea leaves.
J. Plant. Crops. 9(2); 1981; 124-5

COCOA

- 247 NILES (EV). Microflora of imported cocoa beans.
J. Stored Prod. Res. 17(3); 1981; 147-50

A representative sample of cocoa beans from each of 9 countries was examined microbiologically by dilution plating of the ground-up beans. Three of the four samples from the caribbean gave counts of over 10^6 /g. In contrast, samples from Nigeria, New Guinea and Malaysia gave counts of about 10^2 /g. Two fungi, *Aspergillus fumigatus* and *Rhizomucor pusillus* were present in all the samples. Total numbers of bacteria and actinomycetes ranged from about 10^6 to over 9.0×10^7 /g of beans. AA

- 248 OGUNMOYELA (OA) and BIRCH (GG). Physicochemical aspects of sweetness in cocoa drinks.
J. Agric. Food Chem. 30(1); 1982; 77-81

The role of lecithin and glycerol monostearate in modifying the sweetness of cocoa drinks was investigated. While both surfactants enhanced the sweetness of the drinks and both reduced their surface tension, only glycerol monostearate increased their viscosity. Statistical analysis of panelists' responses showed that a significant inverse relationship exists between surface tension and sweetness response, the latter being measured in terms of both intensity and persistence. These results help to resolve conflicting reports of the effects of hydrocolloids on basic taste. They are discussed in terms of possible mechanisms of taste chemoreception. AA

WINE

- 249 BALLESTA (L), OLEA SERRANO (R), and GARCIA-VILLANOVA (R). Spectrophotometric study of acetalhydo-semicarbazone and its application to the determination of acetaldehyde in wines.
An. Bromatol. 32(4); 1980; 367-74 (Spanish)

Using the method of formation of acetalhydo-semicarbazone, the acetaldehyde content of small samples of wines can be determined faster than by other methods, within the range 8.8-61.6 mg acetaldehyde/l. Both free acetaldehyde and that combined with bisulphite can be determined in this way. KMD

- 250 GUERZONI (ME), ZIRONI (R), INTRIERI (C) and MAGNANINI (E). Stabilization of white wine by early hyperoxidation of must.
Food Technol. Aust. 33(9); 1981; 442, 444-6

Wine was produced from mechanically-harvested and hand-harvested white grapes (*Vitis vinifera* cv. Trebbiano di Romagna) that were crushed in either oxygen (hyperoxidation, HO), sulphur dioxide (SO_2) or normal (control) atmospheres. Hyperoxidation produced within a few minutes a strong enhancement of polyphenoloxidase activity in the must and decreased the total polyphenols content of the resultant wines. As a result, the HO wines were lighter or similar in colour to that of the control wines and much lighter than that of the SO_2 wines. Browning tests also indicated that the colour of the HO wines was more stable than that of the control and SO_2 wines. Hyperoxidation of grapes severely affected with *Botrytis cinerea* gave rise to wines that were lighter in colour and had lower orthodiphenol content than that of the control wines. Additional *in vitro* experiments have shown that the chloroplast-linked tyrosinase activity in HO musts is initially strongly activated and then rapidly deactivated. Kinetic studies showed that HO increased the enzyme affinity for the orthodiphenolic substrates (DOPA) and decreased the enzyme V max. From a practical point of view, the present work suggests that as an alternative to SO_2 treatment, HO of musts prepared particularly from mechanically-harvested grapes crushed in the field or from grapes affected with *Botrytis* can produce wines of greater colour stability than those from control musts. AA

MALT

- 251 WEST (DB). Analysis and evaluation of barley used in the malt beverage industry.
J. Assoc. Off. Anal. Chem. 64(5); 1981; 1138-41
The American Society of Brewing Chemists methods for barley moisture, extract, and potential diastatic power are presented. These methods were reviewed by a Barley Analysis Subcommittee during 1975-1980 and published as recommended procedures. The moisture determination has been adopted as an official first action ASBC-AOAC method. AA
- 252 GYLLANG (H), HAIKARA (A), SIGSGAARD (P) and KJELLEN (K). Evaluation of fungal contaminations on barley and malt.
J. Inst. Brew. 87(4); 1981; 248-51
Three methods (general, for fusarium on barley and for storage fungi) have been collaboratively tested for evaluation of the degree of fungal contamination of barley and malt. BSN
- 253 SLACK (PT) and WAINWRIGHT (T). Hordenine as the precursor of nitroso-dimethylamine in malt.
J. Inst. Brew. 87(4); 1981; 259-63

BEER

- 254 GONZALEZ (S), VERCELLINO (JC), MELLA (MA) and WITTIG (E). Characteristics and composition of Chilean and imported beers.
An. Bromatol. 32(4); 1980; 315-26 (Spanish)
Twenty-four samples of Chilean beer and 12 samples of foreign beer have been analyzed and 27 different parameters (including various chemical constituents and physico-chemical properties) have been determined and compared. It is shown that one bottle of beer (285 cc) contains as much riboflavin, twice as many calories, and one-third as much of protein as 100 g of pasteurized milk. Moreover, the calorie and protein supply of beer is similar to that from the majority of Chilean fruits (per 100 g of product). KMD
- 255 BRIGGS (DE) and CORNISH-BOWDEN (A). The calculation of results of α -amylase assays.
J. Inst. Brew. 87(4); 1981; 222-3
- 256 JACOBSON (T) and LIE (S). Can zinc in yeast be used as an indicator of the wort zinc level?
J. Inst. Brew. 87(4); 1981; 223
- 257 LANCE (DG), KAVANAGH (TE) and CLARKE (BJ). The determination of α - and β -acids in hops and hop products using high performance liquid chromatography.
J. Inst. Brew. 87(4); 1981; 225-8
A rapid reversed phase HPLC method for the analysis for α - and β -acids in hops and hop products is described and has been evaluated. The method uses citric acid in the eluent as a complexing agent to overcome the irreversible adsorption effects shown by some columns, thus allowing optimum eluent pH to be selected. The precision of the method for analysis of hop extract has been determined giving relative standard deviations of 1.0% and 2.1% for α - and β -acids respectively. General agreement with results obtained using a polarimetric α -acids analysis method for hop extracts and hops has been demonstrated. AA
- 258 VAN VUUREN (HJJ) and TOERIEN (DF). Phenotypic properties, metabolic activities and electrophoretic protein patterns of *Klebsiella oxytoca* and *Klebsiella pneumoniae* strains isolated from lager beer breweries.
J. Inst. Brew. 87(4); 1981; 229-31

- 259 VERZELE (M) and DEWEALE (C). On the quantitative high pressure liquid chromatography analysis of tricyclodehydro-isohumulone in hops and beer. *J. Inst. Brew.* 87(4); 1981; 232-3
HPLC analysis resulted in detection of small or even total absence of tricyclodehydro-isohumulone in hops or lagers. BSN
- 260 BROWN (A), GOODEY (A) and TUBB (RS). Interstrain transfer of the 2 μ mm DNA plasmid of *Saccharomyces* by cytoduction. *J. Inst. Brew.* 87(4); 1981; 234-8
- 261 GOODEY (A), BROWN (A) and TUBB (RS). Transfer of nuclear genes during cytoduction in *Saccharomyces*. *J. Inst. Brew.* 87(4); 1981; 239-41
- 262 JACKSON (G). A technique for identifying foam damage by lipids. *J. Inst. Brew.* 87(4); 1981; 242-3
Removal of lipids is accomplished by binding to a cellulose matrix (preptube) thereby enabling assessment of foam stability in beer. Pre-tubes do not interfere with foam stabilising materials like isohumulones and peptides. BSN
- 263 SCOTT (RW), THEAKER (PD), MARSH (AS), GRIMMETT (CM), LAWS (DRJ) and SHARPE (FR). Use of extracts prepared with liquid carbon dioxide as a substitute for dry hops. *J. Inst. Brew.* 87(4); 1981; 252-8
- 264 SEARLE (BA) and TUBB (RS). Regulation of amyloglucosidase production by *Saccharomyces diastaticus*. *J. Inst. Brew.* 87(4); 1981; 244-7

LIQUOR

- 265 KOOISTRA (PC). Solving the problems of pressing the ultra-fine imported liquors. *Manuf. Confect.* 61(8); 1981; 46-7

OILS AND FATS

- 266 KROLL (S). Possibilities and limits of water economy in oil refining plants. *Fette Seifen Anstrichm.* 82(9); 1980; 357-65 (German)
- 267 LUND (ED), SHAW (PE) and KIRKLAND (CL). Components of key lime leaf oil. *J. Agric. Food Chem.* 30(1); 1982; 94-5
- 268 LUND (ED), SHAW (PE) and KIRKLAND (CL). Components of Meyer lemon leaf oil. *J. Agric. Food Chem.* 30(1); 1982; 95-7
- 269 RABEL (FM). Care of reverse phase high performance liquid chromatographic columns when injecting extracts of fat- or oil-based preparations. *J. Assoc. Off. Anal. Chem.* 64(5); 1981; 1258
- 270 ACKMAN (RG). Potential for more efficient methods for lipid analysis. *Fette Seifen Anstrichm.* 82(9); 1980; 351-7
- 271 MEAD (JF). Membrane lipid peroxidation and its prevention. *J. Am. Oil. Chem. Soc.* 57(12); 1980; 393-7
The study of membrane peroxidation has been carried out using model systems consisting of a polyunsaturated fatty acid monolayer and an unsaturated phosphatidylcholine bilayer system. It has been shown that

the major products of lipid peroxidation in monolayer and mixed saturated-unsaturated liposomes are epoxides, hydroxy-epoxides and their hydrolysis products. The same products are found in lungs of rats, particularly after 24 hours of breathing 6 ppm NO₂. In all cases, inclusion of tocopherol introduces a lag period during which little peroxidation occurs. AA

- 272 JEWELL (NE) and NAWAR (WW). Thermal oxidation of phospholipids 1,2-dipalmitoyl-sn-glycerol-3-phosphoethanolamine.
J. Am. Oil Chem. Soc. 57(12); 1980; 398-401
- 273 El-SHATTORY (Y), deMAN (L) and deMAN (JM). Evaluation of hydrogenation catalyst activity.
J. Am. Oil Chem. Soc. 57(12); 1980; 402-4
- 274 SINGLETON (JA) and PATTEE (HE). A preconcentration and subsequent gas liquid chromatographic analysis method for trace volatiles.
J. Am. Oil Chem. Soc. 57(12); 1980; 405-8
- 275 HENDERSON (SK), WITCHWOOT (A) and NAWAR (WW). The autoxidation of linoleates at elevated temperatures.
J. Am. Oil Chem. Soc. 57(12); 1980; 409-13
- 276 OSMAN (SM), ANSARI (AA) and CHARLES (D). Solvomercuration - Demercuration. Studies on isoricinoleic acid.
Fette Seifen Anstrichm. 82(9); 1980; 365-7
- 277 WOO (AH) and LINDSAY (RC). Development and characterisation of an improved silicic acid-KOH arrestant column for routine quantitative isolation of free fatty acids.
J. Am. Oil Chem. Soc. 57(12); 1980; 414-6
- 278 Van NIEKERK (PJ) and SMIT (SCC). The determination of vitamin D in margarine by high performance liquid chromatography.
J. Am. Oil Chem. Soc. 57(12); 1980; 417-21
Margarine manufactured in South Africa contains vitamin D added at a level of 1-3 international units per gram. Because of the high ratio of lipid to vitamin D, it is difficult to determine the vitamin content for control purposes. A high performance liquid chromatographic method for the determination of vitamin D in margarine is proposed. The unsaponifiable fraction of a margarine sample is chromatographed twice on an adsorption system. The vitamin D fraction collected from this column is finally injected into a reverse phase system where vitamins D₂ and D₃ are separated and quantitated with an ultraviolet detector. Vitamin D₂ is used as an internal standard for vitamin D₃ or vice-versa, depending on the form of the vitamin added to margarine. The recovery of 100 ng/g vitamin D₃ added to a margarine mix was 100.1% (coefficient of variation 13.2% for 12 replicates) as calculated from the ratio of peak areas. The detection limit is 1 ng vitamin D. Results for 3 samples of margarine and one sample of butter are given. AA
- 279 IHARA (S) and TANAKA (T). *Betula platyphylla* var. *Japonica* seed oil: A rich source of linoleic acid.
J. Am. Oil Chem. Soc. 57(12); 1980; 421-2
Component fatty acids of the oil extracted from *Betula platyphylla* Sukatchev var. *japonica* Hara (Betulaceae) seeds were analyzed by gas liquid chromatography. The predominant fatty acid was linoleic acid (87%), and together with oleic and linolenic acids the 18-carbon unsaturated acids amounted to 97% of the total acids. AA
- 280 MENDEN (E) and BROD (B). Development of different parameters of the lipid and protein metabolism as a function of protein and carbohydrate supply.
Getriede Mehl Brot. 34(9); 1980; 247-50 (German)

The results of the examinations give no indication of a possible harmfulness of stable, high protein supply. However, they do give rise to a fear that a long-term uptake of protein rich and fat rich diets at the same time, along with a relatively high cholesterol supply, should be viewed as increased risk for the development of cardiovascular diseases. A partial replacement of animal protein by vegetable protein, limiting the cholesterol supply at the same time, seems to have favourable effects only if the energy uptake and body weight remain at a low level. As such, starch rich diets, owing to lower total lipid values can be evaluated as more favourable. In contrast, saccharose rich diets resulted with increasing age of experimental animals, in an increase of body and liver fat and β -LP. The differences in the behaviour of different parameters of the lipid and protein metabolism show the significance of long-term experiments with animals and human beings of different age groups. VR

- 281 STAGE (H). Optimum lay out of technical plants for straight distillation of natural fatty acids.
Fette Seifen Anstrichm. 82(9); 1980; 337-51 (German)

SPICES AND CONDIMENTS

VINEGAR

- 282 VALDEHITA (MT), CARBALLIDO (A) and MELGAR (MJ). Citramalic acid in vinegars. I. Separation by thin-layer chromatography.
An. Bromatol. 32(4); 1980; 381-92 (Spanish)
Conditions have been standardized for the determination of citramalic acid in vinegars by thin-layer chromatography. The minimum quantity detected in 4 μ g. This acid is present only in vinegars obtained by fermentation, and not in synthetically produced vinegars. KMD

PEPPER

- 283 GREENBERG (RS). Gas-liquid chromatographic method for determining oxamyl in peppers, tomatoes and cucumbers.
J. Assoc. Off. Anal. Chem. 64(5); 1981; 1216-20

ANISE

- 284 GHOSAL (S), CHAKRABARTI (DK), SRIVASTAVA (AK) and SRIVASTAVA (RS). Toxic 12,13-epoxytrichothecenes from anise fruits infected with *Trichothecium roseum*.
J. Agric. Food Chem. 30(1); 1982; 106-9

SENSORY EVALUATION

- 285 VOISEY (PW) and KLOEK (M). Effect of cell size on the performance of the shear-compression texture test cell.
J. Texture Stud. 12(2); 1981; 133-9
- 286 BOURNE (MC) and COMSTOCK (SH). Effect of degree of compression on texture profile parameters.
J. Texture Stud. 12(2); 1981; 201-16
Texture Profile Analysis (TPA) was performed on apple, carrot, frankfurter, cream cheese and pretzels with the Instron and the effect of the degree of compression on TPA parameters measured at a compression speed of 5 cm/min. Fracturability is almost independent of the degree of compression. Hardness, area 1, area 2, cohesiveness, gumminess, and chewiness usually increase with increasing compression but the rate of

increase varies widely. Springiness increases for pretzel sticks and decreases for the four other commodities as compression increases. Adhesive force and adhesive area of cream cheese increase but stringiness decreases with increasing compression. Since the TPA parameters vary so widely with degree of compression, all TPA measurements should standardize the degree of compression and clearly state in reports what compression was used. AA

- 287 MATSUMOTO (S) and SHERMAN (P). A preliminary study of W/O/W emulsions with a view to possible food applications.
J. Texture Stud. 12(2); 1981; 243-57

- 288 IZUTSU (T), TANEYA(S), KIKUCHI (E) and SONE (T). Effect of viscosity on perceived sweetness intensity of sweetened sodium carboxymethylcellulose solutions.
J. Texture Stud. 12(2); 1981; 259-73

To establish a relationship between perceived sweetness intensity (Y), sucrose concentration (A%) and viscosity of mixed solutions (B poise), mixtures of sucrose solutions in various concentrations and sodium carboxymethylcellulose with medium viscosity (CMC-M) in various concentrations were used, resulting in the equation:

$$Y = 0.86A^{1.04} B^{-0.08}$$

where "Y" = sucrose concentration of reference solutions. This equation was effective within the ranges of 4% to 16% sucrose and viscosities of from 1 to 100 poises. This equation was applicable to low and high as well as medium viscosity forms of CMC. AA

FOOD STORAGE

- 289 GOLOB (P). A practical appraisal on in-farm storage in Malawi. 1. The valley agricultural development area.
Trop. Stored Prod. Inf. No. 40; 1981; 5-13
- 290 GOLOB (P). A practical appraisal of on-farm storage losses and loss assessment methods in Malawi. 2. The Lilongwe land development programme area.
Trop. Stored Prod. Inf. No. 41; 1981; 5-11
- 291 GRACEY (AD). Construction of new storage facilities. Avoidable problems.
Trop. Stored Prod. Inf. No. 41; 1981; 13-8
- 292 HAYWARD (LAW). Structural features of warehouses adapted for long term storage in dry tropical climates.
Trop. Stored Prod. Inf. No. 40; 1981; 14-23

INFESTATION CONTROL AND PESTICIDES

- 293 HALSTEAD (DGH). Taxonomic notes on some *Attagenus* spp. associated with stored products, including a new black species from Africa (Coleoptera: Dermestidae).
J. Stored Prod. Res. 17(3); 1981; 91-9
- 294 ATTIA (FI), SHIPP (E) and SHANAHAN (GJ). Inheritance of resistance to malathion, DDT and dieldrin in *Plodia interpunctella* (Lepidoptera: Pyralidae).
J. Stored Prod. Res. 17(3); 1981; 109-15

Diagnosis of heterogeneous resistance in a field strain of *Plodia interpunctella* enabled selection to be made of a susceptible and three resistant strains with resistances specific to malathion, DDT or dieldrin respectively. Resistance of F1 larvae from crosses between susceptible and resistant moths was intermediate for each resistance. Diagnostic doses were used to determine the mode of inheritance for the three resistances. Tests on larvae from F2 crosses and repeated backcrosses showed that resistance to malathion was due to a semi-dominant gene. Tests on F2 and first back-cross larvae suggested that resistance to DDT and dieldrin was also-explicable in terms of distinct single, semi-dominant genes. AA

- 295 JAY (EG) and CUFF (W). Weight loss and mortality of three life stages of *Tribolium castaneum* (Herbst) when exposed to four modified atmospheres.

J. Stored Prod. Res. 17(3); 1981; 117-24

Larvae, pupae, and adults of *Tribolium castaneum* (Herbst) were exposed to atmospheres containing high nitrogen (N₂) or carbon dioxide (CO₂) concentrations at about 50% r.h. and 27 C for periods up to 72 hours. Overall, 99% N₂ caused greater mortality in adults than did 58% CO₂ while 58% CO₂ was more effective against pupae. The difference in mortality to larvae exposed to the two atmospheres was not significant, though 99% N₂ produced greater mortalities by 48 hours. Also, the differences in mortality for larvae and pupae exposed to atmospheres of 58% CO₂ and 97% CO₂ were not significant though 97% CO₂ caused a significantly greater mortality in adults than did 58% CO₂. Both mortality and weight loss of all life stages tested were small when the insects were exposed to an atmosphere of 97% N₂, but weight loss was generally small and mortality was large for those insects exposed to 97% CO₂. When overall weight loss was compared for those insects exposed to 58% CO₂ and 99% N₂, larval weight loss was greater for those exposed to the CO₂ atmosphere; pupal weight loss was not significantly different between the two atmospheres; adult weight loss was greater for those exposed to the N₂ atmosphere. AA

- 296 MUGGLETON (J), DURAN (JE) and ROWLANDS (DG). The effect of holding adult *Oryzaephilus surinamensis* (L.) (Coleoptera: Silvanidae) at different temperatures on their subsequent susceptibility to malathion.

J. Stored Prod. Res. 17(3); 1981; 125-30

There is reason to believe that the temperature prior to exposure may effect the response of adult *Oryzaephilus surinamensis* to the recommended discriminating dose test for malathion resistance. Experiments were carried out in which four malathion resistant strains of *O. surinamensis* were kept at 15, 20, 25 and 30 C for two weeks prior to testing at 25 C. It was found that conditioning at the lower temperatures resulted in a significantly higher knockdown than conditioning at the higher temperatures. For each 5 C fall in conditioning temperature there was a 7.5% increase in knockdown. Chemical analysis showed that in the first hour of exposure more malathion was taken up by the beetles conditioned at lower temperatures than by those conditioned at the higher temperatures. AA

- 297 TYLER (PS) and EVANS (N). A tentative method for detecting resistance to gamma-HCH in three bruchid beetles.

J. Stored Prod. Res. 17(3); 1981; 131-5

- 298 STOCKEL (J) and EDWARDS (JP). Susceptibility of *Sitotroga cerealella* (Oliv.) (Lepidoptera: Gelechiidae) to two insect juvenile hormone analogues.

J. Stored Prod. Res. 17(3); 1981; 137-41

- 299 SINCLAIR (ER). Sexing live adult *Rhyzopertha dominica* (F.) (Coleoptera: Bostrychidae).

J. Stored Prod. Res. 17(3); 1981; 143-5

- 300 VEERESH (GK) and PATIL KULKARNI (BG). Role of plant protection in meeting the demand of food for 2000 A.D. Pesticides. 15(12); 1981; 3-5
- 301 THOMSON (WAR). Making pesticides safe for humans and animals. Pesticides. 15(11); 1981; 3-4
- 302 TAYLOR (RW). Low volatility (liquid) fumigants. Trop. Stored Prod. Inf. No. 41; 1981; 19-20
- 303 DOHAREY (RB), ASHOK KUMAR and VARMA (BK). Results of field trials with pirimiphos methyl 50% EC against stored grain insect pests. Pesticides. 15(11); 1981; 7-11
- 304 JOTWANI (MG) and SRIVASTAVA (KP). Neem: Insecticide of the future. III. Chemistry, toxicology and future strategy. Pesticides. 15(12); 1981; 12-5
- 305 DRAUGHON (FA) and AYRES (JC). Inhibition of aflatoxin production by selected insecticides. Appl. Environ. Microbiol. 41(4); 1981; 972-6
- 306 ALI (FAF) and FUKUTO (TR). Toxicity of O,O,S-trialkyl phosphorothioates to the rat. J. Agric. Food Chem. 30(1); 1982; 126-30
A series of simple O,O-dimethyl and O,O-diethyl S-alkyl phosphorothioate esters were prepared and examined for acute and delayed toxicity to rats. Several of the compounds were highly toxic to the rat, with death occurring over a period of 1-11 days. Most of the compounds caused symptoms of delayed intoxication, i.e., weight loss, diarrhea, uncontrolled urination, and haemorrhaging. All of the esters were poor inhibitors of bovine erythrocyte acetylcholinesterase and rat plasma cholinesterase, the O,O-dimethyl esters being virtually devoid of inhibitory activity. The poor anticholinesterase activity of these compounds suggests a noncholinergic mechanism of action. AA
- 307 NEEDHAM (LL), BURSE (VW) and PRICE (HA). Temperature-programmed gas chromatographic determination of polychlorinated and polybrominated biphenyls in serum. J. Assoc. Off. Anal. Chem. 64(5); 1981; 1131-7
- 308 GUINIVAN (RA), THOMPSON (NP) and BARDALAYE (PC). Simultaneous electron capture detection of chlorpyrifos and its major metabolite, 3,5,6-Tri-chloro-2-pyridinol, after gel permeation chromatography. J. Assoc. Off. Anal. Chem. 64(5); 1981; 1201-4
- 309 SIMONAITIS (RA), CAIL (RS) and ZEHNER (JM). Rapid cleanup procedure for gas-liquid chromatographic determination of chlorpyrifos-methyl residues in cat food. J. Assoc. Off. Anal. Chem. 64(5); 1981; 1227-31
- 310 LUKE (MA), FROBERG (JE), DOOSE (GM) and MASUMOTO (HT). Improved multi-residue gas chromatographic determination of organophosphorus, organo-nitrogen, and organohalogen pesticides in produce, using flame photometric and electrolytic conductivity detectors. J. Assoc. Off. Anal. Chem. 64(5); 1981; 1187-95
- 311 WEST (SD) and DAY (EW) Jr. Extraction of aquatic herbicide fluridone from water and determination by high pressure liquid chromatography. J. Assoc. Off. Anal. Chem. 64(5); 1981; 1205-7

BIOCHEMISTRY AND NUTRITION

- 312 KUHLMANN (W), HALWACHS (W) and SCHUGERL (K). Resolution of racemic amino acids by immobilization of acylase in an aqueous two phase system. *Chemie-Ingenieur-Technik*. 52(7); 1980; 607
- 313 OSTROWSKI-MEISSNER (HT). The effects of storage and heating on lysine availability of food-grade proteins from pasture herbage as measured by chemical, biological and microbiological assays. *J. Food Quality*. 3(4); 1980; 275-82
 Food grade protein concentrates isolated from pasture herbage stored and/or heated either alone or with glucose to cause various types of damage to lysine were analysed for available lysine by chemical and bioassays with chickens, mice, rats, and protozoon *Tetrahymena pyriformis*. Chemical methods gave varying results, and the values are lower than those of biological methods. The responses of mice and *Tetrahymena pyriformis* to various types of lysine damage were similar to those observed with chicks, while rats appeared to be less sensitive test animals in detecting the changes in lysine availability in stored or heat processed foods. KAR
- 314 MANZ (U) and PHILIPP (K). A method for the routine determination of tocopherols in animal feed and human foodstuffs with the aid of high performance liquid chromatography. *Int. J. Vitamin Nutr. Res.* 51(4); 1981; 342-8
 A HPLC method is described for the routine determination of the α -tocopherol content in feed ingredients, in final feed mixtures, in pre-mixes and vitamin concentrates. The method includes saponification of the samples, extraction of the unsaponifiable components and high performance liquid chromatography on silica gel with fluorescence detection of the resultant tocopherols. AA
- 315 VOIGT (MN), CLARKE (JD), JAIN (AV), AYRES (JC), KOEHLER (PE) and HATCH (RC). Abnormal concentrations of B vitamins and amino acids in plasma and B vitamins in the bile of rabbits with aflatoxicosis. *Appl. Environ. Microbiol.* 41(4); 1981; 919-23
- 316 LAGE (A), SIMAL (J) and TOCA (MJ). Application of second derivative spectroscopy to the qualitative and quantitative analysis of vitamin C. *An. Bromatol.* 32(4); 1980; 353-60 (Spanish)
 Vitamin C has been estimated in lemons (*Citrus medica* var. Lemon L.) and spinach (*Spinacia oleracea* L.) by a new spectrophotometric method. Potassium cyanide is used to eliminate the interferences produced by copper and other metals; it forms complexes with the metals and the latter do not produce any absorption that wavelength characteristic of vitamin C, i.e. 265 nm in a neutral medium. The results are perfectly reproducible, and similar to those obtained by the voltametric method. KMD

TOXICOLOGY AND HYGIENE

- 317 KLEIN (AW) and KOCH (TR). Lead accumulations in brain, blood and liver after low dosing of neonatal rats. *Arch. Toxicol.* 47(4); 1981; 257-62
- 318 CHMIELNICKA (J), SZYMANSKA (JA) and SNIIEC (J). Distribution of tin in the rat and disturbances in the metabolism of zinc and copper due to repeated exposure to SnCl_2 . *Arch. Toxicol.* 47(4); 1981; 263-8

- 319 VER KUILEN (SD).and MARTH (EH). Sporocidal action of hypochlorite on conidia of *Aspergillus parasiticus*.
J. Food Prot. 43(10); 1980; 784-8
- 320 KOZLOSKI (RP). Novel thin layer chromatographic techniques for aflatoxin analysis.
J. Assoc. Off. Anal. Chem. 64(5); 1981; 1263-4
Some procedures for improving thin layer chromatographic (TLC) spot size and fluorescence intensity are described. By using strong eluting solvents, diffuse TLC spots can be reduced in size and poorly resolved chromatograms returned to their original state for redevelopment. The blanketing of weak aflatoxin bands with an inert layer of gas results in an increase in UV fluorescence. AA
- 321 DUNSMORE (DG), WESTWOOD (DA), JAY (DB) and EMBLING (M). Simulator technique for assessing the bacteriological control of food equipment surfaces by cleaning systems.
J. Food Prot. 43(11); 1980; 850-5
- 322 D'AUBERT (S), ABBATI (P) and CANTONI (C). Food poisoning by *B. cereus*.
Ind. Aliment. 19(178); 1980; 913-21 (Italian).
This paper devotes to a review of information pertinent to the role of *B. cereus* as a food borne pathogen. An outbreak of food poisoning by *B. cereus* has also been described here. AA
- 323 ANDRES (WH), WILSON (CR), POELMA (PL), BULLOCK (LK), McCLURE (FD) and GENTILE (DE). Interlaboratory evaluation of the AOAC method and the A-1 procedure for recovery of fecal coliforms from foods.
J. Assoc. Off. Anal. Chem. 64(5); 1981; 1116-21
- 324 JIWA (SFH), KROVACEK (K) and WADSTROM (T). Enterotoxigenic bacteria in food and water from an Ethiopian community.
Appl. Environ. Microbiol. 41(4); 1981; 1010-19
- 325 HAUBECK (H-D), LORKOWSKI (G), KOLSCH (E) and ROSCHENTHALER (R). Immunosuppression by ochratoxin A and its prevention by phenylalanine
Appl. Environ. Microbiol. 41(4); 1981; 1040-42
- 326 HAGLER (WM), MIROCHA (CJ) and PATHRE (SV). Biosynthesis of radio-labeled T-2 toxin by *Fusarium tricinctum*.
Appl. Environ. Microbiol. 41(4); 1981; 1049-51

GENERAL

- 327 MUNIRATHNA NAIDU (K) and RAO (GUK). Transfer of technology from developed to developing nations. South. Econ. 20(18); 1982; 9-12
- 328 SUNITHA (CP). Is import of technology from developed countries absolutely necessary? South. Econ. 20(18); 1982; 13-6
- 329 KHAN (MA). Evaluation of food selection patterns and preferences. CRC Crit. Rev. Food Sci. Nutr. 15(2); 1981; 129-53
Discusses: concepts and definitions; factors influencing food preferences; methodologies; food attitude questionnaires; tests and techniques; tracing food habits; changes in food habits and preferences; food liked and disliked; and nutritional evaluation of food habits and preferences. BSN
- 330 ANON. Food consumption trends. Br. Food J. 83(905); 1981; 166-7
- 331 ANIL SHARMA and JOSEPH (R). Enzyme processing of agricultural waste for some applications. Indian Food Packer. 36(1); 1982; 50-53
Aspects covered include, effect of culture fluids on agricultural wastes; stimulating production, culture and enzyme production and assays and estimations of xylanase, amylase, pectinase, carboxymethyl cellulases cultured on agricultural wastes like wheat bran, banana peel and bark, rice bran, saw dust, xylose, coffee parchment and shells from walnut, groundnut, almond and cotton seed. BSN

FOOD PROCESSING AND PACKAGING

- 332 BAGHE-KHANDAN (MS). CHOI (Y) and OKOS (MR). Improved line heat source thermal conductivity probe. J. Food Sci. 46(5); 1981; 1430-32
An improved line heat source thermal conductivity probe was made to simplify the construction and extend the life of thermal conductivity probes. The accuracy of thermal conductivity measurement is also improved. The better linearity of temperature versus logarithm of time was obtained as compared to published techniques. The probe made with the heater wire and thermocouple on the outside of a sewing needle instead of inside of a hypodermic needle was checked by measuring the thermal conductivity of known samples. Results obtained with the improved probe show lower temperature rise and lower standard deviation. AA
- 333 NAESENS (W), BRESSELEERS (G) and TOBBACK (P). A method for the determination of diffusion coefficient of food components in low- and intermediate moisture systems. J. Food Sci. 46(5); 1981; 1446-9
A simple set-up to measure translational diffusion of components in low moisture systems is described. The tracer technique was tested on the diffusion of ^{14}C -labeled tripalmitin and palmitic acid in a model system containing paraffin oil, microcrystalline cellulose and gum arabic. Different methods to evaluate the apparent diffusion coefficients from the experimental diffusion curve were compared. Good results were obtained using a curve-fitting procedure based on the sum of least squares. The technique appears to be suitable for measuring diffusion coefficients up to $10^{-9} \text{ cm}^2/\text{sec}$. The procedure offers the possibi-

lity to quantify the mobility of chemical components in dried foodstuffs in order to elucidate the mechanisms and kinetics of reactions occurring during storage. AA

- 334 UNO (J-I) and HAYAKAWA (K-I). Correction factor of come-up heating based on mass average survivor concentration in a cylindrical can of heat conduction foods.

J. Food Sci. 46(5); 1981; 1484-8

A mathematical expression is derived to estimate a correction factor for come-up heating, which may be used to calculate mass average survival concentrations. For this derivation, analytical heat conduction formulae are used to estimate transient state temperature distributions in a cylindrical can of heat conduction food. Through the dimensional analysis of the derived analytical expression, 12 dimensionless groups are formulated in order to examine the influence of various process conditions as well as of food properties on the correction factors. Theoretical correction factors are then computed for various numerical combinations of these dimensionless groups. Through the nonlinear regression analyses of these computed factors, we obtain algebraic equations for representing these factors as a quadratic function of the dimensionless groups. There is fair agreement between the correction factors estimated by using the algebraic equations and by using heat penetration data collected experimentally. AA

- 335 LITCHFIELD (RJ), LIAPIS (AI) and FARHADPOUR (FA). Cycled pressure and near-optimal pressure policies for a freeze dryer.

J. Food Technol. 16(6); 1981; 637-46

The performance of a freeze dryer operating under either cyclical pressure or near-optimal pressure control has been evaluated by numerical solution of a model describing the process. The particular situation considered was where an interface temperature constraint prevented operation at a pressure which would minimize drying time. Comparison of the two processes showed that over the entire drying period the cycled process was marginally inferior to the near optimal scheme. Hence it appears that in industrial practice the near optimal pressure process, which requires a minimum of additional equipment, would be preferred. AA

- 336 LALCHEV (Zdr) and EXEROWA (D). Concentration of proteins by foaming. Biotechnol. Bioeng. 23(4); 1981; 669-76

FOOD ENGINEERING AND EQUIPMENT

- 337 ZAIDI (AH), DODEJA (AK) and SARMA (SC). Design correlation for plate heat exchanger: A review.

Chem. Age India. 32(11); 1981; 967-70

- 338 MUKHERJEE (SK). Simplified relationships for 1-2 and 2-4 heat exchangers.

Chem. Age India. 32(11); 1981; 971-3

- 339 HOLMES (J). Economies in refrigerated transport.

Food Process. Ind. 50(595); 1981; 40-41, 43, 45

ENERGY IN FOOD PROCESSING

- 340 GURU (DD). Energy crisis in India. Case for biogas form of energy. South. Econ. 20(18); 1982; 17-20

FOOD CHEMISTRY AND ANALYSIS

- 341 POWRIE (WD), WU (CH), ROSIN (MP) and STICH (HF). Clastogenic and mutagenic activities of Maillard reaction model systems. *J. Food Sci.* 46(5); 1981; 1433-8, 1445
 Three short-term bioassays were employed to assess the clastogenic and mutagenic activities of Maillard reaction sugar-amino acid solutions at initial pH values of 7 and 10. All of the Maillard reaction solutions with no S9 activation induced significant increases in chromosome aberrations in Chinese hamster ovary (CHO) cells. Mitotic recombination and mutation occurred in *Saccharomyces cerevisiae* strain D5 cells when exposed to all Maillard reaction solutions. When *Salmonella typhimurium* TA 100 cells were treated with Maillard reaction compounds, induction of revertants to histidine prototrophy occurred. Mutagen concentration in the browning reaction solution was dependent on initial pH. AA
- 342 DABEKA (RW) and McKENZIE (AD). Atomic absorption spectrometric determination of tin in canned foods using nitric acid-hydrochloric acid digestion and nitrous oxide-acetylene flame. *J. Assoc. Off. Anal. Chem.* 64(6); 1981; 1297-300
- 343 YALAVARTHY (PD) and NANDA KUMAR (NV). Simple paper and micro thin layer chromatographic method for separation and detection of mercuric chloride, copper sulphate, cadmium sulphate, and silver nitrate in fresh water. *J. Assoc. Off. Anal. Chem.* 64(6); 1981 1301-4
- 344 SEOW (CC) and TENG (TT). The prediction of water activity of some supersaturated nonelectrolyte aqueous binary solutions from ternary data. *J. Food Technol.* 16(6); 1981; 597-607
- 345 LANG (KW) and STEINBERG (MP). Linearization of the water sorption isotherm for homogeneous ingredients over a_w 0.30-0.95.
J. Food Sci. 46(5); 1981; 1450-52
 Many attempts have been made to quantitate the water sorbed by a material as a mathematical function of water activity (a_w). Based upon a theory of polymolecular absorption, the Smith model states that moisture content is proportional to $\ln(1-a_w)$. Subsequent workers showed this to be accurate to 1% but only between about 0.6 and 0.9 a_w . It was hypothesized that the validity of this model could be extended over a much broader a_w range by applying the model to a single homogeneous ingredient. This was tested by obtaining sorption data for nine materials, including four noncrystalline macromolecules as well as five crystalline solutes, including both sugars and salts. Results showed the model to describe the sorption isotherm for these macromolecules to within 2% over the a_w range 0.30-0.95. The model was shown to be valid in the case of each solute to within 2.5% between the a_w of a saturated solution and 0.95. Correlation coefficients (r) for the nine materials were all greater than 0.995, showing excellent linearity for the model. Fructose showed the highest "% (error)_{AV}", only 3.26. AA
- 346 CHANG (HD) and TAO (LC). Correlations of enthalpies of food systems. *J. Food Sci.* 46(5); 1981; 1493-7
 Correlations of enthalpies of food systems containing water fraction from 0.74-0.94 are presented for a temperature range 230-310 K (-50 to 95 F) with these correlations, energy requirement in freezing and thawing foods within the limits of data base used for this work may be computed by providing the identity of food group (meat juice or vegetable/fruits), water content, initial, and final temperatures. AA
- 347 MIRACCO (JL), AIZAMORA (SM), CHIRIFE (J) and FERRO FONTAN (C). On the water activity of lactose solutions. *J. Food Sci.* 46(5); 1981; 1612-3

FOOD LAWS AND REGULATIONS

- 348 BUSHNELL (AC). New legislation and official literature issued during 1981.
J. Assoc. Public Anal. 20(Pt.1); 1982; 1-16
- 349 ANON. The food labelling regulations 1980. Part I. Of a review of the new regulations to replace the 1970 labelling of food regulations.
Br. Food J. 83(901); 1981; 44-6
- 350 ANON. Food labelling regulations 1980.
Br. Food J. 83(902); 1981; 65-7
- 351 SOHRAB. All about quality certification.
Indian Food Packer. 36(1); 1982; 16-31
Aspects covered include principles of certification; its role in trade and consumer protection; certification systems, methods of testing including audit testing of factory samples, type testing in market and factory, factory quality control assessment, batch and 100% testing, ISI certification, compulsory enforcement of ISI certification, other agencies of certification in India like Agmark, FPO, Meat Products Order, quality marking scheme, certification for export, export certification agencies, types and mechanisms of certification and recognition of certification marks. BSN

FOOD MICROBIOLOGY

- 352 DO (DD) and WEILAND (RH). Enzyme deactivation in fixed bed reactors with Michaelis-Menten kinetics.
Biotechnol. Bioeng. 23(4); 1981; 691-705
- 353 HEIJNEN (JJ) and ROELS (JA). A macroscopic model describing yield and maintenance relationships in aerobic fermentation processes.
Biotechnol. Bioeng. 23(4); 1981; 739-63
- 354 CHEN (YS) and BUNGAY (HR). Microelectrode studies of oxygen transfer in trickling filter slimes.
Biotechnol. Bioeng. 23(4); 1981; 781-92
- 355 TAI (NM) and GREENFIELD (PF). Determination of the inherent deactivation characteristics for the parallel poisoning of immobilized catalase.
Biotechnol. Bioeng. 23(4); 1981; 805-22
- 356 VELICANGIL (O) and HOWELL (JA). Self-cleaning membranes for ultrafiltration.
Biotechnol. Bioeng. 23(4); 1981; 843-54
- 357 WU (H-L) and MEANS (GE). Immobilization of proteins by reductive alkylation with hydrophobic aldehydes.
Biotechnol. Bioeng. 23(4); 1981; 855-61
- 358 MALFAIT (JL), WILCOX (DJ), MERCER (DG) and BARKER (LD). Cultivation of a filamentous mold in a glass pilot-scale airlift fermentor.
Biotechnol. Bioeng. 23(4); 1981; 863-77
- 359 FAWZY (AS) and HINTON (OR). Multilevel control of multistage continuous culture using a microprocessor.
Biotechnol. Bioeng. 23(4); 1981; 887-98

- 360 CONSTANTINIDES (A), BHATIA (D) and VIETH (WR). Immobilization of *Brevibacterium flavum* cells on collagen for the production of glutamic acid in a recycle reactor. Biotechnol. Bioeng. 23(4); 1981; 899-916
- 361 HESSELTINE (CW). Future of fermented foods. Process Biochem. 16(3); 1981; 2, 3-6, 13

YEAST

- 362 MEYER (MT) and PHAFF (HJ). An enzymatic method for the determination of yeast cell wall glucan in foods. J. Food Sci. 46(5); 1981; 1489-92, 1497
Processed cell wall β -glucans prepared from strains of baker's or brewer's yeast can be used as a thickening agent in aqueous food systems and they provide a fat-like mouthfeel. This article describes an analytical procedure for the determination of the glucan content added to a variety of food products. The method is based on measurement of reducing sugars produced when the food sample, after appropriate pretreatment, is treated with a commercial microbial β -glucanase (Zymolyase) that is specific for the β -linkages present in the glucan polysaccharide of the added yeast cell walls. AA
- 363 ZIPKES (MR), GILCHRIST (JE) and PEELER (JT). Comparison of yeast and mold counts by spiral, pour and streak plate methods. J. Assoc. Off. Anal. Chem. 64(6); 1981; 1465-9
Foods with naturally occurring yeast and mold were used in a comparative study of 4 plating techniques. Oats, green beans, and cheese were incubated for 3 and 5 days at 25 C. Although 3 days of incubation would be sufficient for yeast, 5 days were necessary for the mold count. The percent recovery of yeasts and molds by the spiral and streak methods ranged from 200 to 357% compared with the pour plating method described in the Bacteriological Analytical Manual (BAM). The spiral method had the highest overall recovery and the lowest replicate plating error. AA
- 364 HANG (YD) and WOODAMS (EE). Rapid removal of lactic acid from wastewater by a flocculent yeast. J. Food Sci. 46(5); 1981; 1498-9, 1513
- 365 ENGLER (CR) and ROBINSON (CW). Disruption of *Candida utilis* cells in high pressure flow devices. Biotechnol. Bioeng. 23(4); 1981; 765-80

MUSHROOM

- 366 SINGH (RP), DANG (RL), BHATIA (AK) and GUPTA (AK). Water binding additives and canned mushrooms yield. Indian Food Packer. 36(1); 1982; 39-43
Various water binding agents have been tried to minimize shrinkage losses in canned mushrooms (*Agaricus bisporus*). Steeping the buttons in 0.5% solutions of methyl cellulose and carboxy methyl cellulose helped in increasing the yield by 4.9 and 9.0% respectively, without any deleterious effect on the quality. Further increase in yield upto 10.3, 11.7 and 15.0% was recorded with the pectin-calcium combination, methyl cellulose and carboxy methyl cellulose respectively at 1.5% concentration level of each, but the organoleptic quality was affected. Food additives like agar at 0.125% and pectin at 0.5% level helped in improving the flavour of the canned product. BSN

FOOD ADDITIVES

- 367 HURST (WJ), McKIM (JM) and MARTIN (RA) Jr. Ion pairing high pressure liquid chromatographic determination of amaranth in licorice products. *J. Assoc. Off. Anal. Chem.* 64(6); 1981; 1411-3
- 368 WALSON (PD), CARTER (DE), RYERSON (BA), CLARK (D) and PARKINSON (TM). Intestinal absorption of two polymeric food dyes in man. *Food Cosmet. Toxicol.* 19(6); 1981; 687-90
The intestinal absorption of two ^{14}C -labelled polymeric dyes - D00481 (red) and D00607 (yellow) - was measured in healthy, adult men. The findings indicate minimal absorption of these two dyes in man, but do reflect a delayed and prolonged faecal excretion of D00481 in some subjects. KMD
- 369 DUNNINGTON (D), BUTTERWORTH (KR), GAUNT (IF), MASON (PL), EVANS (JG) and GANGOLLI (SD). Long-term toxicity study of ethylmethyl phenylglycidate (strawberry aldehyde) in the rat. *Food Cosmet. Toxicol.* 19(6); 1981; 691-9
This study did not demonstrate a carcinogenic effect in rats given dietary levels of upto 0.5% EMPG and that the no-untoward effect level was 0.1% of the diet, providing an EMPG intake of approximately 35 mg/kg/day in males and 60 mg/kg/day in females. AA
- 370 TAKAHASHI (O) and HIRAGA (K). Inhibition of phylloquinone epoxide-dependent carboxylation of microsomal proteins from rat liver by 2,6-di-tert-butyl-4-methylene-2,5-cyclohexadienone. *Food Cosmet. Toxicol.* 19(6); 1981; 701-6
2,6-di-tert-butyl-4-methylene-2,5-cyclohexadiene, a major hepatic metabolite of BHT, did not inhibit the carboxylation reactions dependent on vitamin K_1 hydroquinone or on phylloquinone (vitamin K_1), but did inhibit the phylloquinone-epoxide-dependent carboxylation. Thus, the BHT metabolite must have inhibited the phylloquinone epoxide reductase, and, as a result, the prothrombin precursor accumulated in the microsomes of rats treated with BHT. KMD
- 371 MOSTAFA (MH), RUCHIRAWAT (M) and WEISBURGER (EK). Effect of indole on N-nitrosodimethylamine demethylase in rats treated with carbon tetrachloride. *Food Cosmet. Toxicol.* 19(6); 1981; 717-21
The inhibitory effect of CCl_4 on NDMA-demethylase I activity could be counteracted by feeding rats with indole. Although feeding indole significantly increased the level of cytochrome P-450, it only partially counteracted the decrease in this cytochrome produced by pretreatment with CCl_4 . KMD
- 372 BUTTERWORTH (KR) and MASON (PL). Acute toxicity of thioguaiacol and of versalide in rodents. *Food Cosmet. Toxicol.* 19(6); 1981; 753-5
Thioguaiacol, a pungent-smelling liquid used in meat products and baked goods, causes death in rats and mice within 7 days. Its LD_{50} (95% confidence limits) value lies between 1270 and 3690 mg/kg body weight. There were no treatment related findings at autopsy, either in animals that died or in those surviving on the seventh day. The LD_{50} value for Versalide in male rats was 215-315 mg/kg body weight. Acute toxic signs indicated effects on the central nervous system. A green substance was formed in the gastro-intestinal tract, and most tissues, including the central nervous system, showed a green-blue or grey colouration. KMD
- 373 MELIKIAN (AA), LAVOIE (EJ), HOFFMANN (D) and WYNDER (EL). Volatile nitrosamines: Analysis in breast fluid and blood of non-lactating women. *Food Cosmet. Toxicol.* 19(6); 1981; 757-9
Breast fluid and blood samples taken from four healthy non-lactating women 1 hour after ingestion of a high nitrate-nitrite meal were analysed

for volatile nitrosamines. N-Nitrosamines were not detected in the breast-fluid samples, but both N-nitrosodimethylamine and N-nitrosodiethylamine were found in the blood samples. The levels, however, did not show a consistent increase over those in blood samples taken from the same subject before consumption of the test meal. AA

- 374 WATANABE (M), TOYOKAWA (H), SHIMADA (A) and ARAI (S). Proteinaceous surfactants produced from gelatin by enzymatic modification: Evaluation for their functionality. J. Food Sci. 46(5); 1981; 1467-9

CEREALS

- 375 JONES (FE) and BRICKENKAMP (CS). Automatic Karl Fischer titration of moisture in grain. J. Assoc. Off. Anal. Chem. 64(6); 1981; 1277-83

RICE

- 376 LORENZ (K). Wild Rice: The Indian's staple and the white man's delicacy. CRC Crit. Rev. Food Sci. Nutr. 15(3); 1981; 281-319

- 377 MALLICK (AK) and NANDI (B). Rice - Results of India experiments. Rice J. 84(2); 1981; 8-13

'Ratna' cultivar of rice grain in sealed storage for one year with an initial moisture of 12.5% did not show significant fluctuations in the various parameters (moisture, dry matter, germinability, seedling growth, total carbohydrate, protein content, fungal infection, type and population of field and storage fungi and the degree of infection) studied as compared to normal storage. Population of storage fungi increased with concomittant decrease of field fungi with longer time of storage. Rice stored under natural conditions, which became infected due to rains and high humidity showed increased level of fungal infection. With concomittant decrease of field fungi with longer time, an increase in population of storage fungi was observed. Higher the moisture level, quicker was the deterioration observed, as evidenced from rate of grain deterioration of reconstituted grain (moisture 14.0 and 17.0%). BSN

- 378 SINGH (KDN), KHAN (BM) and PRASAD (CR). Effect of different types of soil salinity, nitrogen, and phosphorus on amino acid content of rice grains.

J. Inst. Chem. (India) 54(III); 1982; 104-6

Presence of SO_4^{-2} , HCO_3^{-1} , CO_3^{-2} and Cl^{-1} in soil led to a decrease in the amino acid content of rice. The amino acid content of rice grown on soils containing Cl^{-1} or SO_4^{-2} , decreased when PO_4 was added to the soil, but increased when N was added. When both N and PO_4 were added, the amino acid content of rice grown on Cl^{-1} type saline soil increased, while that of rice grown on SO_4^{-2} type saline soil decreased. KMD

- 379 ORY (RL), DeLUCCA (AJ) II, St. ANGELO (AJ) and DUPUY (HP). Storage quality of brown rice as affected by packaging with and without carbon dioxide.

J. Food Prot. 43(12); 1980; 929-32

Brown rice in laminated bags plus CO_2 was more stable under refrigerated conditions than at ambient temperatures. However, at 24 C storage, there was no consistent significant decrease in free fatty acids, lipid peroxides and volatile compounds in these bags compared to the other types of packing. Laminated bags seem to have had an adverse effect on total microbial populations at both 4 and 24 C. Selection of either type of package for brown rice would be governed by end use, storage time and conditions. AA

- 380 PEREZ (CM) and JULIANO (BO). Texture changes and storage of rice. J. Texture Stud. 12(3); 1981; 321-33
- Monthly texture assessments of seven milled rices, differing in amylose content and stored at 28-30 C, verified that three months was the minimum storage period for major changes to occur in hardness of cooked rice, gel consistency, and amylograph viscosity values. Therefore, texture measurements should be done on samples aged at least three months after harvest. Texture changes tend to be greatest for high-amylose rice with hard gel consistency and least for waxy rice. Free fatty acids were highest in stored, waxy, milled rice. Storage under nitrogen instead of air had a slight retarding effect on storage changes of five rices in another study. Surface defatting with petroleum ether had little effect on storage change in cooked rice hardness and stickiness, but reduced the changes in gel consistency and amylograph setback and consistency. AA

WHEAT

- 381 SCOTT (PM), LAU (PY) and KANHERE (SR). Gas chromatography with electron capture and mass spectrometric detection of deoxynivalenol in wheat and other grains. J. Assoc. Off. Anal. Chem. 64(6); 1981; 1364-71
- 382 TRAUBA (RL). Determination of internal insect infestation of wheat. J. Assoc. Off. Anal. Chem. 64(6); 1981; 1408-10
- 383 CURTIS (RF), HOBSON-FROHOCK (A) and FENWICK (GR). Volatile compounds from the mite *Acarus siro* L. in food. J. Stored Prod. Res. 17(4); 1981; 197-203
- The headspace above two strains of *Acarus siro* maintained on wheat germ/bran has been shown to contain the hydrocarbons, decane, undecane and tridecane together with the furanoid terpene, perillen. When the bodies of the separated mites were extracted with diethyl ether a new compound was found in addition to those in the headspace. This compound has been identified as 2-hydroxy-6-methyl benzaldehyde. None of these compounds appear to be responsible for the 'minty' smell reportedly related to mite infestation. AA

MILLETS

PEARL MILLET

- 384 SUBRAMANIAN (V), JAMBUNATHAN (R) and SURYAPRAKASH (S). Sugars of pearl millet (*Pennisetum americanum* (L.) Leeke) grains. J. Food Sci. 46(5); 1981; 1614-5
- The sugars in the grains of nine pearl millet cultivars were fractionated through a Biogel column. Five different sugars (stachyose, raffinose, sucrose, glucose, and fructose) were identified. Sucrose was predominant in all the cultivars. Raffinose content was high as compared to other cereals, and maltose was absent. AA

SORGHUM

- 385 AKINGBALA (JO), ROONEY (LW) and FAUBION (JM). A laboratory procedure for the preparation of *Ogi*, a Nigerian fermented food. J. Food Sci. 46(5); 1981; 1523-6
- A laboratory method was developed and used to prepare *ogi* from seven sorghum cultivars. Mean yields of *ogi*, bran and solubles were 72.9%, 15.9% and 7.5% respectively. Mean *ogi* composition was 84.3% starch, 8.3% protein, 2.5% fat, 0.59% ash, and 1.3% soluble sugars. The protein, fat,

ash, and soluble sugar content of laboratory ogi was within 2% of values obtained from analysis of three commercial Nigerian ogi samples. Yields of ogi were significantly affected by variety of sorghum. AA

- 386 AKINGBALA (JO), ROONEY (LW) and FAUBION (JM). Physical, chemical and sensory evaluation of *ogi* from sorghum of differing kernel characteristics.

J. Food Sci. 46(5); 1981; 1532-6

Seven sorghums were processed into ogi, a Nigerian fermented porridge. The colour, taste, texture, aroma, and consistency of the ogis were evaluated to determine which sorghums had the best properties for ogi preparation. In general, nonwaxy, white sorghums gave ogi the highest ratings for these properties. Waxy sorghums produced ogi with poor, undesirable consistency. The brown high tannin sorghums produced ogi with undesirable brownish-red colour, poor consistency and texture, and low *in vitro* starch and protein digestibility. Ogi prepared with TAM680 and Funk G776W most closely resembles Nigerian ogi. AA

MAIZE

- 387 KEALEY (KS) and KOSIKOWSKI (FV). Corn smut as a food source - perspectives on biology, composition, and nutrition.

CRC Crit. Rev. Food Sci. Nutr. 15(4); 1981; 321-51

Discusses: extent of infection; control of corn smut; evolution of corn smut as food; toxicity of corn smut; processing and utilization; research needs; growth of *Ustilago maydis* in culture, and fermentative studies on *U. maydis*. BSN

- 388 COHEN (H) and LAPOINTE (M). High pressure liquid chromatographic determination and fluorescence detection of aflatoxins in corn and dairy feeds.

J. Assoc. Off. Anal. Chem. 64(6); 1981; 1372-6

- 389 RACICOT (WF), SATTERLEE (LD) and HANNA (MA). Interaction of lactose and sucrose with cornmeal proteins during extrusion.

J. Food Sci. 46(5); 1981; 1500-6

When lactose or sucrose was present during extrusion, the solubility of the proteins in NaCl was generally enhanced over that of the extruded cornmeal control (100% cornmeal). These results suggest that lactose, as well as the inherent glucose released during the thermal degradation of sucrose, interacts with amino acid residues forming a more hydrophilic complex, which could thereby be more salt soluble. This hypothesis is supported by amino acid composition data. Gel filtration chromatography revealed that the high molecular weight proteins in the NaOH soluble fraction had a greater reactivity towards lactose than did the lower molecular weight proteins and peptides. The incorporation of (^{14}C) lactose during the extrusion of a cornmeal-lactose blend indicated a preferential binding of lactose to the salt and alkali soluble proteins, as was determined by measurements of specific protein-bound radioactivity. AA

- 390 WIEBE (LA) and BJELDANES (LF). Fusarin C, A mutagen from *Fusarium moniliforme* grown on corn.

J. Food Sci. 46(5); 1981; 1424-6

A noncrystalline bacterial mutagen was isolated from corn infected with *Fusarium moniliforme* and given the trivial name fusarin C. High-resolution mass spectral data and combustion analysis indicated a molecular formula of $\text{C}_{23}\text{H}_{29}\text{NO}_7$ for fusarin C, the major mutagenic metabolite. The ultraviolet, infrared, and proton and carbon magnetic resonance spectra were recorded for this compound. Feed containing 56% corn infected with *F. moniliforme* supported growth of day-old cockerels and produced no apparent toxic effects. AA

BAJRA

- 391 CHANDRASEKHAR (G) and PATTABIRAMAN (TN). Natural plant enzyme inhibitors: Isolation and characterization of two trypsin inhibitors from Bajra (*Pennisetum typhoideum*).
Indian J. Biochem. Biophys. 19(1); 1982; 1-7
- Two trypsin inhibitors; (i) TI-1 and (ii) TI-2, isolated from bajra (*Pennisetum typhoideum*), a common millet of South India were purified by extraction with 0.1 N HCl, ammonium sulphate fractionation, chromatography on CM-cellulose and gel chromatography on sephadex G-50. On cellulose acetate and SDS-Polyacrylamide gel electrophoresis, (i) and (ii) were homogeneous. They were active on bovine trypsin, but were totally inactive on bovine α -chymotrypsin. Gel electrophoresis under dissociating conditions indicated that the molecular weight of (i) and (ii) were around 11000. Pepsin and α -chymotrypsin did not inactivate the inhibitors, but pronase treatment partially inactivated them. There was complete loss of inhibitory activity on modification of arginyl residues of the inhibitors. Sephadex G-100 gel chromatography demonstrated the formation of enzyme - inhibitor complexes between the two inhibitors and bovine trypsin. The mode of inhibition in both cases, was non-competitive and the K_i values for (i) and (ii) were 1.93×10^{-6} M and 5.79×10^{-7} M respectively. MVG

PULSES

- 392 VARRIANO-MARSTON (E) and JACKSON (GM). Hard-to-cook phenomenon in beans: structural changes during storage and imbibition.
J. Food Sci. 46(5); 1981; 1379-85
- Dry black beans stored at high temperatures (41 C) and humidities (75%, 100%) for short time periods showed alterations in attachments between plasmalemma and cell wall as well as disintegration of organelles and inclusions of the cytoplasm. Although those structural changes did not affect the mode of water penetration into aged beans as determined by autoradiography, electron micrographs clearly revealed structural differences between fresh and aged beans during imbibition. AA
- 393 REETA GOEL and VERMA (J). Removal of flatulence factor of some pulses by microbial fermentation.
Indian J. Nutr. Dietet. 18(6); 1981; 215-7
- The effect of fermentation of pulses, green gram (*Phaseolus aureus*), black gram (*Phaseolus mungo*), and lentil (*Lens culinaris*) by bacteria (*Leuconostoc mesenteroides* and *Lactobacillus acidophilus*) has been studied. Polysaccharides present in pulses are degraded to lower sugars, of which sucrose is one of the major products. As such, these sugars are easily digestible and, therefore, render fermented pulses to become easily digestible by consumers. BSN

CHICK PEA

- 394 SINGH (U) and JAMBUNATHAN (R). Studies on desi and kabuli chickpea (*Cicer arietinum* L.) cultivars: Levels of protease inhibitors, levels of polyphenolic compounds and *in vitro* protein digestibility.
J. Food Sci. 46(5); 1981; 1364-7
- The levels of trypsin inhibitor activity were higher in both kabuli and desi seeds of chickpea than their chymotrypsin inhibitor activity. Mean values for the trypsin and chymotrypsin inhibitor units in dhal and seed samples of desi were higher as compared with kabuli cultivars. The presence of seed coat reduced the protein extraction. Mean values of polyphenolic compounds in seed samples of desi were more than twice that of kabuli and these differences disappeared in dhal samples indicating the distribution of these compounds mainly in the seed coat. The

in vitro protein digestibility studies showed larger differences between desi seed and dhal samples when compared with kabuli seed and dhal samples. Polyphenolic compounds exhibited a highly significant and negative correlation ($r = 0.872$) with *in vitro* digestibility of protein and a significant positive correlation with trypsin ($r = 0.612$) and chymotrypsin ($r = 0.507$) inhibitor activities. AA

- 395 FERNANDEZ De TONELLA (ML), TAYLOR (RR) and STULL (JW). Properties of a chocolate-flavoured beverage from chick pea. Cereal Food. World. 26(9); 1981; 528-9

Composition and processing factors involved in the preparation of a chocolate-flavoured beverage from whole chick pea (*Cicer arietinum*) were evaluated. Following mild alkali treatment to drastically reduce the typical beany off-flavour and odour of the chick pea, trypsin inhibitor was inactivated by blanching. A slurry of the alkali-treated, blanched whole chick peas was then sequentially treated with an α -amylase and a fungal protease to reduce the final viscosity of the product. The enzyme treated slurry was then combined with suitable amounts of vegetable oil, sugar, cocoa, salt, emulsifier, vanilla, and diacetyl and homogenized. The finished beverage had acceptable sensory properties. The viscosity of the product was higher than desired, being more typical of a shake-type beverage. Other physical characteristics were acceptable. AA

FABABEAN

- 396 CULIOLI (J) and SALE (P). Spinning of fababean protein. 1. Flow properties of fababean protein dopes by capillary extrusion viscometry. J. Texture. Stud. 12(3); 1981; 335-50

Flow properties of Fababean protein dopes were studied by capillary extrusion viscometry. The consistency of these dopes was time dependent for pH values between 11 and 13 and it increased slightly with time. At still higher pH values, it decreased sharply after 1 hour aging. For protein concentration between 11% and 15% (w/w), and pH 11-13.5, these dopes exhibited shear thinning behaviour in the shear rate range 500-20,000 s^{-1} and they followed the power law $\tau = c\dot{\gamma}^n$. This relationship could be written in the dimensionally homogeneous form:

$$\tau = \tau_0 \left(\frac{\dot{\gamma}}{\dot{\gamma}_0} \right)^n$$

When the protein concentration of the dopes increased, the power law index (n) decreased and the consistency index (C) increased. A maximum consistency was reached at pH 12.5, while the power law index was minimum. The results can be explained in terms of protein-protein interactions and of macromolecule denaturation. AA

- 397 CULIOLI (J) and SALE (P). Spinning of fababean protein. 2. Spinnability of dopes and textural properties of protein fibres. J. Texture Stud. 12(3); 1981; 351-63

Experiments were carried out to determine the influence of the pH and the protein content of fababean protein dopes on the spinning process and on the textural properties of resulting fibres. Spinning was only possible if the protein content of the dopes was over 10% and the pH over 11. It was only under 12% that the protein content affected the spinning and the fibre characteristics. The spinnability expressed in terms of maximum takeup velocity increased with pH until a maximum value was reached at pH 12.5 and over. The properties of the fibres were related to the pH of the corresponding dopes: the shear strength increased and the moisture content decreased when the pH varied from 11 to 13.5. Spinnability of protein dopes and textural characteristics of the fibres are much dependent on the denaturation of the macromolecules in the dopes which influences the chain-chain interactions in the fibres. AA

FIELD BEAN

- 398 RAMAMANI (S) and SUBRAMANIAN (N). Growth depressing effects of isolated fractions from field bean (*Dolichos lablab*) on albino rats. Indian J. Nutr. Dietet. 18(7); 1981; 243-54

Antinutritive factors present in 80% ethanol extract or dilute hydrochloric acid extract of green field bean, when isolated in concentrated forms and fed along with casein diet to albino rats induce histopathological changes in the liver, intestine and spleen and also cause growth depression. The acetone precipitate (F₄ fraction) obtained from the acid extract having high activities of TI and haemagglutinin was the most potent growth depressing factor(s), followed by the fatty fractions F₂ from 80% ethanol extract or F₃ from hexane extract. AA

GREAT NORTHERN BEAN

- 399 CHANG (KC) and SATTERLEE (LD). Isolation and characterization of the major protein from Great Northern beans (*Phaseolus vulgaris*). J. Food Sci. 46(5); 1981; 1368-73

The major protein of Great Northern beans was isolated through salt extraction, ammonium sulphate fractionation, gel filtration and DEAE-cellulose ion exchange chromatography. Physicochemical properties of the major bean protein were determined. Results from heat stability studies showed that the protein was the most stable at pH values between 4 and 6. A complete unfolding of the bean protein was not essential in order to improve its digestibility. The native protein had a compact structure and therefore was resistant to the attack by proteolytic enzymes. A glycopeptide, containing a N-glycosidic protein-carbohydrate linkage, isolated from a protease digestion of the major bean protein was also characterized. Results implied that the carbohydrate moiety might have a negative influence on the digestibility of the native protein. AA

- 400 SATHE (SK) and SALUNKHE (DK). Fermentation of the Great Northern bean (*Phaseolus vulgaris* L.) and rice blends. J. Food Sci. 46(5); 1981; 1374-8, 1393

Black gram (*Phaseolus mungo*) cotyledons could be substituted by the Great Northern bean (*Phaseolus vulgaris* L.) whole seeds in preparation of idli. The products prepared from conventional blend (black gram:rice :: 1:1 w/w) and the Great Northern bean-rice blend (1:2 w/w) were comparable. The latter had somewhat different flavour and a sticky top surface. Physicochemical changes in the Great Northern bean-rice blends (1:1 and 1:2 w/w) paralleled each other while those in the fermentation of the beans alone differed from both the blends. No significant hydrolysis was observed in the major proteins in all the batters studied in 45 hours fermentation. Scanning electron microscopic observations indicated that starch granules were resistant to both, the fermentation and steaming. AA

LIMA BEAN

- 401 DETHE (MD), RAUT (UM) and KADAM (MV). Residues of endosulfan in lima-bean pods. Indian J. Agric. Sci. 52(1); 1983; 7-10

Initial endosulfan deposit (10.52 ppm) in bean pods was found to dissipate reaching the tolerance limit of 2 ppm, fixed by WHO/FAO for most of the vegetables, within 1.87 days after spraying, there was more than 93% reduction in residues in 3 days. This indicated that the bean pods were safe for consumption when plucked 2 days after spraying with 0.05% endosulfan. Beta endosulfan dissipated more slowly than alpha endosulfan. The half life of alpha and beta endosulfan was 1.01 and 1.14 days respectively. After tenth day these became undetectable. Effect

of certain processing methods on endosulfan residues was also studied. It was found that washing alone reduced the level of residues by 22.71% to 69.55%. Washing as well as cooking of pods resulted in reduction of residue by 62.95 to 84.72%. MVG

PIGEON PEA

- 402 SRIVASTAVA (SK) and BAJPAI (RK). Some chemical characteristics of new varieties of pigeon pea (*Cajanus cajan*(L.) Mill sp.) Indian J. Nutr. Dietet. 18(5); 1981; 166-70

Data on chemical composition (moisture, crude fibre, lipid, carbohydrate, reducing and non-reducing sugars, crude protein, NPN, actual protein, total ash, water soluble ash, water insoluble ash, acid insoluble ash, alkalinity of water soluble ash, Ca and P of newer varieties CT-21, JA9-19, JA-3, GWL-3 and JA-15 of pigeon pea (*Cajanus cajan*)) have been reported along with the chemical composition of other varieties of *Cajanus cajan*. BSN

MUNG BEAN

- 403 FARHANGI (M) and VALADON (LRG). Effect of acidified processing and storage on carotenoids (Provitamin A) and vitamin C in mung bean sprouts. J. Food Sci. 46(5); 1981; 1464-6

Blanching of mung bean sprouts has little effect on total carotenoids and β -carotene. Canned sprouts stored at RT for 6 months lost smaller amounts of total and 'active' carotenoids compared with bottled sprouts. Blanching resulted in approximately 50% loss of vitamin C in fresh mung bean sprouts but storage temperatures alone produced little change in vitamin C. Canned sprouts stored at RT for 6 months contained only 30% of the vitamin C of stored bottled sprouts. Fresh mung bean sprouts contained 19 μg 100g⁻¹ β -carotene and 15 mg 100g⁻¹ vitamin C. AA

WINGED BEAN

- 404 SATHE (SK) and SALUNKHE (DK). Investigations on winged bean (*Psophocarpus tetragonolobus* L. DC) proteins and antinutritional factors. J. Food Sci. 46(5); 1981; 1389-93

Two cultivars of winged bean (Chimbu and HF-10) were investigated. The molecular weight distribution profiles of two cultivars differed significantly. Major protein subunits of Chimbu had estimated molecular weights of 51,000, 18,000, 15,400, and 12,300 daltons while subunits with estimated molecular weights of 145,000; 55,000; 29,000; 14,700; and 14,000 daltons characterized HF-10 proteins. Sequential extraction with distilled water and 2% NaCl recovered 91.08 and 87.7% (respectively for Chimbu and HF-10) of the total proteins. Soaking the beans in alkali resulted in elimination of hemagglutinating activity, significant reduction in tannins and trypsin inhibitory activity and improvement in *in vitro* protein digestibility. AA

OILSEEDS AND NUTS

CHIA

- 405 BUSHWAY (AA), BELYEA (PR) and BUSHWAY (RJ). Chia seed as a source of oil, polysaccharide, and protein. J. Food Sci. 46(5); 1981; 1349-50, 1356

Chia seed, *Salvia polystachya*, was analyzed as a source of oil, polysaccharide, and protein for possible use by the food industry. Seeds were found to contain 30% oil of which more than 90% was composed of triglycerides. The fatty acid composition of the oil was found to consist mostly

of C16:0, C18:0, C18:2 and C18:3. The protein content of chia seed was found to be 23.4%. A very viscous polysaccharide was isolated from the seeds. Acid hydrolysis followed by gas liquid chromatographic analysis demonstrated that xylose and arabinose were the major constituents of the polysaccharide. Seeds were found to contain niacin, riboflavin, and thiamin at a concentration of 83, 2 and 14 µg/g seed, respectively. Spectro-chemical analysis showed the presence of eleven elements with calcium, potassium, and phosphorus being the most prominent. The percentage of unsaturated fatty acids, the concentration of protein and the viscosity of the polysaccharide in chia seeds would indicate that further research should be conducted to investigate possible food uses for these seeds. AA

GROUNDNUT

- 406 GUPTA (SK), KAMAL DHAWAM, PARKASH KUMAR and YADAVA (TP). Note on the chemical composition of some groundnut strains. Indian J. Agric. Sci. 52(5); 1982; 343-4

Twenty five varieties of groundnut were tested for their chemical composition. The range in values for different contents were; oil 44.52 - 48.60%; protein 24.05 - 33.25%; reducing sugars 1.18 - 1.97%; total sugars, 7.44 - 14.24% and pod yield 2598 - 5583 Kg/ha. Maximum oil and protein yield was by varieties Sel 6 and J₁ respectively MH₂ gave the maximum pod yield. MVG

- 407 MAHADEVAIAH (B), BALDEV RAJ, VIJAYENDRA RAO (AR) and ANANDASWAMY (B). Studies of raw groundnut oil in flexible pouches. Indian Food Packer. 36(1); 1982; 73-80

Storage behaviour of raw groundnut oil in high density polyethylene (200 and 300 gauge) and polypropylene film (300 gauge) pouches were studied under 27 C, 65% RH and 38 C, 92% RH storage conditions. The groundnut oil appears to keep well in these pouches for a period of 3-4 months as evident from the post-storage period analyses of peroxide value, free fatty acids and organoleptic tests. AA

LUPIN

- 408 BLAICHER (FM), NOLTE (R) and MUKHERJEE (KD). Lupin protein concentrates by extraction with aqueous alcohols. J. Am. Oil Chem. Soc. 58(7); 1981; 761-5

MUSTARD

- 409 RAINA (BL), KALRA (CL), RODRIGUEZ (R), TEOTIA (MS), VARADARAJAN (AR) and DHANARAJ (S). Canning of curried mustard greens (*Brassica campestris* var. Sarson). Indian Food Packer. 36(1); 1982; 91-5

Curried mustard greens (*Brassica campestris* var. Sarson) in N. India in canned form has a good domestic and export market potential. A few traditional recipes were evaluated for colour, texture, aroma and taste along with two commercial samples and two formulations with the maximum acceptability for these attributes have been selected with the help of a panel of judges. The selected recipes consisted of 9 ingredients. Incorporation of traditionally used balancing leaves such as spinach or other leaves along with ingredients like tomatoes and onions affect the taste and colour of the product adversely. Effect of 1-3% level of thickening agent (maize flour) on product quality has been studied and the optimum level was found to be at 1% of the raw material used. The product remained acceptable even after one year of storage at ambient temperature of 20-37 C. BSN

- 410 RHODES (D). Note on the determination of rapeseed oil in mustard oil. J. Assoc. Public Anal. 20(Pt.1); 1982; 23-4

A possible explanation of disappointing results in the method for detecting rapeseed oil in mustard oil is advanced, and an alternative procedure to that which has been suggested for estimating the amount of admixture by Critical Solution Temperature is described. AA

RAPESEED

- 411 CHAMBERLAIN (SJ). Etrimfos residues in rapeseed oil during laboratory scale refining.

J. Stored Prod. Res. 17(4); 1981; 183-5

Residues of etrimfos (0-6-ethoxy-2-ethylpyrimidin 4-yl-0, 0-dimethylphosphorothionate) in rapeseed oil were examined during a laboratory scale refining technique. Little loss of residue occurred during neutralisation; however, appreciable loss occurred during bleaching and 94.3-99.5% loss occurred after steam distillation. The aqueous distillate contained 12% of the etrimfos present at the start of distillation. The extracted meal contained no detectable etrimfos residue. AA

SESAME

- 412 BRAR (GS). Variations and correlations in oil content and fatty acid composition of sesame.

Indian J. Agric. Sci. 52(7); 1982; 434-9

27 diverse introductions of sesame (*Sesamum indicum* Linn) which were screened, exhibited large variations in the contents of seed oil (46.58%), iodine value (98-127), oleic acid (30-63%) and linoleic acid (23-52%). Oleic acids and linoleic acids exhibited high heritability and coefficient of variations. Location and genotype location interactions were significant for all the fatty acids. A negative correlation between iodine value and oleic acid (0.72) and a positive correlation between iodine value and linoleic acid (0.85) were observed. Regression equations were developed for calculations of oleic and linoleic acid (%) from iodine value of the oil. Seed tissues analysis showed variations in oleic acid (26-74%) and linoleic acid (15-15%) which were greater than the contents in whole seeds. MVG

SOYABEAN

- 413 ANON. Food uses of the soyabean. Br. Food J. 83(905); 1981; 168-70

- 414 SINGH (SP), RAO (SK), SARMA (SM) and GUPTA (AK). Note on factors influencing the cooking time of soyabean.

Indian J. Agric. Sci. 52(8); 1982; 545-6

The interrelationships of cooking quality with the chemical composition of soyabean (*Glycine max* (Linn.) Merr.), its genetic association of maturity and physical characteristic were studied. Results showed that selection for early maturity in soyabean population may lead to simultaneous improvement in seed characteristics like seed volume, dal (split seed) percentage and cooking time. Maturity showed a strong association with cooking time. At the phenotypic level, maturity showed a negative association with seed weight, seed volume and dal percentage. But seed weight had positive association with seed volume and dal percentage. Seed volume had a positive association with dal percentage, but negative association with seed density. MVG

- 415 FLINT (FO) and JOHNSON (RFP). A study of film formation by soy protein isolate.

J. Food Sci. 46(5); 1981; 1351-3

Film formation of soy protein at an oil water boundary has been evaluated for the pH range 1-10. Definite films were seen at all pH values below that of the isoelectric point of the protein and up to pH 6.5. Beyond 7.4 increasing solubility of the protein limits observable film formation. The technique described shows that the lipophilic behaviour of soy protein is active over a pH range which includes most food systems and all meat emulsions. AA

- 416 LIENER (IE) and TOMLINSON (S). Heat inactivation of protease inhibitors in a soyabean line lacking the kunitz trypsin inhibitor.

J. Food Sci. 46(5); 1981; 1354-6

The effect of heat treatment (autoclaving at 121 C, 15 psi for various periods of time) on the trypsin- and chymotrypsin-inhibitor activities of a soyabean line lacking the Kunitz trypsin inhibitor (SBTI) was compared to that of commercial untoasted soy flour. The trypsin- and chymotrypsin-inhibitor activities of the SBTI-free soyabeans were approximately one-half and three-fourths that of the soy flour, respectively. Less heat treatment was required to produce a given level of destruction of these inhibitor activities in the case of the SBTI-free soyabeans than with the soy flour. The effect of heat on the ratio of chymotrypsin- to trypsin-inhibitor activities was notably different between the two soyabean samples and presumably reflects differences in the amounts and thermal stability of the various protease inhibitors known to be present in soyabeans. The nutritional implications of these findings are discussed. AA

- 417 YANO (T), KONG (J-Y), MIYAWAKI (O) and NAKAMURA (K). The "intrinsic" thermal conductivity of wet soy protein and its use in predicting the effective thermal conductivity of soyabean curd.

J. Food Sci. 46(5); 1981; 1357-61

The applicability of four heat conduction models to heterogeneous materials was examined for defatted soy protein curd with various water contents. Only the series model was applicable to both frozen and unfrozen soy protein curds. The "intrinsic" thermal conductivity of wet soy protein was determined on the basis of the series model to be 0.300 W/mK for unfrozen curd and 0.488 W/mK for frozen curd. By using the series model and the "intrinsic" thermal conductivity values of soy protein, the effective thermal conductivity of fat-containing soyabean curd, unfrozen or frozen, was predicted satisfactorily. The "intrinsic" thermal conductivity values of wet soy protein were independent of temperature in the ranges from 0 to 20 C and from -5 to -20 C. AA

- 418 MORR (CV). Nitrogen conversion factors for several soyabean protein products.

J. Food Sci. 46(5); 1981; 1362-3, 1367

Nitrogen conversion factors, based on amino acid content (Factor Method) and micro-Kjeldahl nitrogen content (Kjeldahl Method), were computed for defatted soyabean flakes, several laboratory isolates, and a commercial soy protein isolate. Computed nitrogen conversion factors were 5.64-6.08 (Kjeldahl Method) and 6.70-6.84 (Factor Method). Individual values for each nitrogen conversion factor did not differ significantly within each group (Factor Method or Kjeldahl Method). In contrast, the difference between the two groups is of major importance to the food industry. The Factor Method is recommended to provide the most accurate conversion factor. AA

- 419 TARANTO (MV), KUO (CM) and RHEE (KC). Possible role of the crude fiber of soy flour in texture formation during nonextrusion texturization processing.

J. Food Sci. 46(5); 1981; 1470-77

Scanning electron and transmitted light microscopy were used to study the role of crude fiber in texture formation during non-extrusion processing of soy flour. By comparing micrographs of texturized soy flour,

water-extracted texturized soy flour, texturized soy concentrate, texturized soy isolate, and texturized soy product-hull blends, transmitted light and scanning electron microscopy showed that removal of the soluble carbohydrate fractions either before or after nonextrusion texturization did not alter the morphology or microstructure of the texturized soy concentrate or water-extracted texturized soy flour as compared to texturized soy flour. Therefore, it seems probable that the presence of the soluble carbohydrate fractions is not a prerequisite for the formation of the alveolate morphology normally created during nonextrusion processing. Scanning electron microscopy showed that the cuticle morphology of the texturized soy isolate's alveoli was changed as the amount of crude fiber in the soy hull-soy isolate blend increased. The cuticle morphology of the texturized soy isolate-soy hull blend was similar to that of the texturized soy concentrate and texturized soy flour. Therefore, crude fiber seems to control the type of alveolation developed and the type of cuticle morphology exhibited in the product's alveoli. AA

- 420 DONNELLY (LS) and BUSTA (FF). Alternative procedures for enumeration of *Desulfotomaculum nigrificans* spores in raw ingredients of soy protein-based products.

J. Food Sci. 46(5); 1981; 1527-31

The effectiveness of commonly used enumeration media for measurement of laboratory-produced spore crops of *Desulfotomaculum nigrificans* was examined in comparison with a modified infant soy formula broth. While not significantly more productive in all cases, three spores were recovered in the modified infant soy formula (ISFbroth) than in the other media tested. Rapid growth of *D. nigrificans* in infant soy formula was not uniquely associated with any commercial brand. An alternative procedure for the enumeration of *D. nigrificans* spores in soy protein isolate including a heat shock and incubation time greater than current recommendations, was described. A specially formulated soytone based medium used in a tube, was equal to or superior in productivity to sulfite agar. *D. nigrificans* spore counts different brands of soy protein isolates and concentrates ranged from <0.2-151/g with average counts of 16-26/g. In a limited study, spore counts for carrageenan ranged from 45-163/g. AA

- 421 JASBERG (BK), TAYLOR (NW), MUSTAKAS (GC) and BAGLEY (FB). Determination of dynamic moduli of soy doughs using an orthogonal rheometer. J. Texture. Stud. 12(3); 1981; 307-19

- 422 ANNIE MATHEW and RAUT (DS). Effect of soya milk on the growth of malnourished children admitted to hospital wards. Indian J. Nutr. Dietet. 18(7); 1981; 260-67

- 423 MELTZER (JB), FRANKEL (EN), BESSLER (TR) and PERKINS (EG). Analysis of thermally abused soyabean oils for cyclic monomers. J. Am. Oil Chem. Soc. 58(7); 1981; 779-84

This study was undertaken to quantitate the cyclic monomers formed by thermal oxidation induced during deep fat frying to assess the potential toxicity of commonly used vegetable oils. Both lightly hydrogenated soyabean oil (iodine value (IV) = 107) and refined, bleached and deodorized soyabean oil were studied. The heated oil sustained substantial chemical and physical alterations, as indicated by IV decreases from 10-15 units, increases in free fatty acids of 5-10 fold and in noneluted material of 18-21%. Selected samples were completely hydrogenated and analyzed for cyclic monomers by gas chromatography. No cyclic monomers were detected in any of the heated oil samples. However, after concentration by low temperature crystallization of the hydrogenated samples to remove a major portion of the saturated components interfering in cyclic monomer resolution, about 0.3-0.6% cyclic acids, as well as 0.4-0.9% polar materials, were detected in the heated soyabean oils. Components appearing in the gas chromatogram with the same retention time as those in a cyclic monomer standard were further identified by gas chromatography-mass spectrometry as disubstituted cyclic C-18 acids. AA

- 424 MOUNTS (TL), WARNER (K) and LIST (GR). Flavour and oxidative stability of hydrogenated and unhydrogenated soyabean oil: Effect of tertiary butyl hydroquinone.

J. Am. Oil Chem. Soc. 58(7); 1981; 792-4

The efficacy of tertiary butyl hydroquinone (TBHQ) treatment for enhancement of the storage stability of soyabean oil has been studied by flavour evaluation and chemical analysis. The oils were also evaluated after being subjected to accelerated storage tests (4 days and 8 days at 60 C) and a fluorescent light exposure test (4 hours ambient temperature). Peroxide development during storage was beneficially reduced in oils treated with TBHQ. The flavour stability of the three oils was not enhanced by treatment with TBHQ under any test conditions. AA

SUNFLOWER

- 425 LEUNG (J), FENTON (TW) and CLANDININ (DR). Phenolic components of sunflower flour.

J. Food Sci. 46(5); 1981; 1386-88, 1393

The phenolic compounds of seven cultivars of sunflower seed were evaluated through acid and base hydrolysis using thin-layer chromatography, gas chromatography and gas chromatography-mass spectroscopy as investigative tools. Caffeic acid, the most predominant phenolic acid, along with p-hydroxybenzoic, p-coumaric, cinnamic, m-hydroxybenzoic, vanillic, and syringic acids were identified in both types of hydrolysate with only slight variations in concentrations among the cultivars. Relatively larger amounts of these acids were detected in the basic hydrolysates except in the cases of p-hydroxybenzoic, vanillic, and syringic acids, indicating that these acids may exist in glycosidic form to a larger extent than in ester form in the cultivars examined. AA

- 426 RAHMA (EH) and NARASINGA RAO (MS). Removal of polyphenols from sunflower meal by various solvents: Effects on functional properties.

J. Food Sci. 46(5); 1981; 1521-2, 1526

The protein and chlorogenic acid (CGA) content, nitrogen solubility index (NSI), water and fat absorption, emulsification capacity, foaming capacity, and foam stability of dehulled, defatted sunflower meal treated by various solvent systems to remove polyphenols were determined. All solvent treatments resulted in increased protein content, markedly reduced the CGA content, and increased water absorption capacity (WAC). Organic solvents caused a decrease in NSI whereas water, 0.002N HCl, or 2% NaCl solution caused an increase. Aqueous ethanol extraction decreased fat absorption emulsification, and foaming capacity. Acidic n-butanol increased foaming capacity, multiple solvent system did not affect it and other solvents used decreased it. AA

TUBERS AND VEGETABLES

- 427 VIJAY SETHI and ANAND (JC). Chemical preservation of vegetables at room and low temperatures.

Indian J. Agric. Sci. 52(8); 1982; 536-9

Cauliflower (*Brassica oleracea*), long melon (*Cucumis melo*) and pea (*Pisum sativum*) were studied. Cauliflowers and long melon were cut into suitable sizes, washed and drained. Peas were hand shelled and graded. The vegetables were estimated for moisture, protein, acidity, ascorbic acid, sugar, total SO₂ and catalase and peroxidase activities both while fresh and after preservation. The vegetables were packed upto neck in 445 g glass jars and were preserved as (i) vegetable + 5% salt + 1.0% acetic acid (ii) vegetable + 5% salt + 1.2% lactic acid and acetic acid (4:3) + 0.1% potassium meta bisulphite and (iii) vegetable + 5% salt + 1.2% lactic acid and acetic acid (4:3) + 0.3% sodium benzoate. The quantity of solution was approximately equal to the quantity of vegetable in the case of long melon and pea and in cauliflower it was approxi-

mately double the quantity of the vegetable. After filling, the lids were wax sealed, and stored at room temperature (25-35 C) and low temperature (9-10 C). Results showed that cauliflower and pea retained fair proportions of vitamin C. Pea had 6.58% protein, while cauliflower and long melon had protein content ranging from 1.4 to 2.5%. At room temperature, (ii) performed best followed by (i) and (iii). Sodium benzoate caused browning in all samples and softening in cauliflower and long melon. In cauliflower and long melon stored at room temperature for one year, catalase and peroxidase activities were nil; in pea, only a slight peroxidase activity was observed in all samples. Lower temperature storage performed better in retention of colour and texture and caused less leaching losses in covering solution. MVG

- 428 JELEN (P) and CHAN (C-S). Firming of canned vegetables by addition of lactose.
J. Food Sci. 46(5); 1981; 1618-9

Blanched carrots, green beans, and peas were retorted at 121 C in 2% NaCl brine containing variable amounts of dissolved lactose. After 37 and 68 days, hardness of the canned vegetables was tested by Instron. Increasing lactose content correlated significantly with average hardness of peas ($r = 0.94$ and 0.96 , respectively), beans ($r = 0.81$ and 0.91) and to a lesser degree, carrots ($r = 0.71$ and 0.37). All products from brines containing 8% or more lactose showed higher average hardness than those containing less or no lactose. The increase in hardness was noticeable to an untrained sensory panel. Samples packed in 8-15% lactose brines were ranked significantly higher in firmness than those canned with 5% or less lactose. AA

- 429 DAHIYA (B) and CHAUHAN (R). Organochlorine insecticide residues in vegetable samples from Hissar market.
Indian J. Agric. Sci. 52(8); 1982; 533-5

Summer and winter vegetable samples (140 Nos) from Hissar (Haryana, India) were screened by thin-layer chromatography and bioassay for organochlorine insecticide residues. Results showed that only 33 (23.6%) samples were contaminated with DDT, BHC and endosulfan. Pea (*Pisum sativum* Linn.) showed minimum DDT residues (0.04 ppm), while maximum (1.8 ppm) was observed in ripe tomatoes. BHC residues was minimum (0.8 ppm) in chilli; higher amounts 6.0 ppm were found in carrot (*Dacus carota* Linn.). Minimum of endosulfan (0.6 ppm) was found in chilli, and maximum was noticed in pea. Bioassay results for the residues correlated with those obtained by thin layer chromatography. Overall contamination was highest (62.5%) in okra samples collected on different dates followed by unripe chilli and tomato (50%) and Knol-Kohl (*Brassica oleracea* Linn.) 12.1% samples had DDT residues of 0.4-1.8 ppm which was far below the prescribed tolerance limits. Higher percentage of samples (62.5%) were contaminated with BHC, the residues ranged from 0.8 to 6.0 ppm. Endosulfan was found in only 24% samples and the residues varied from 0.6 to 1.7 ppm. Samples collected during the end of March and beginning of February had higher contamination than those collected during February and early March. MVG

ONION

- 430 FARAG (RS), SHABANA (MK) and SALLAM (HA). Biochemical studies on some chemical characteristics of sliced Egyptian onions.
J. Food Sci. 46(5); 1981; 1394-9

Biochemical studies were carried out on two widely distributed Egyptian onion varieties (Behairy and Selected Giza 6). Several treatments (soaking in tap water, boiling water, cold water, warm ethanol, or sodium chloride solution) were proposed to overcome onion reddening during industrial processing. Some chemical characteristics (L-ascorbic acid, free amino acids, volatile sulphur compounds, carbonyl compounds, pungency and colour) were determined in fresh, treated and stored sliced onions. Unsaturated fatty acids can be considered as a

secondary source for carbonyl compounds and are involved in the formation of red pigments. Pronounced changes among hydrocarbons and little changes in sterols were due to application of various treatments and storage. In general, the most efficient treatments towards keeping onion quality were soaking the sliced onions in cold water or 5% (w/v) sodium chloride for 24 hours before onion dehydration. AA

BEET

- 431 BILYK (A), KOLODIJ (MA) and SAPERS (GM). Stabilization of red beet pigments with isoascorbic acid.
J. Food Sci. 46(5); 1981; 1616-7

Isoascorbic acid was investigated as a stabilizer for red beet pigments. Sterilized samples of red beet juice containing 0.05-1.0% isoascorbic acid, with the pH adjusted to 3, 5, or 7, were stored under artificial light or in darkness at 25 C or at 5 C. The best pigment preservation was obtained with 0.1% added isoascorbic acid. After 30 days storage at 25 C, samples at pH 5 containing 0.1% isoascorbic acid retained 52% (under light) and 65% (in darkness) of the red beet pigments, whereas the controls faded to yellow within 6 days under the same conditions. AA

CARROT

- 432 SULLIVAN (JF), KONSTANCE (RP), DELLA MONICA (ES), HEILAND (WK) and CRAIG (JC) Jr. Carrot dehydration. Optimization process studies on the explosion-puffing process.
J. Food Sci. 46(5); 1981; 1537-42

A carrot dehydration process that includes the unique continuous explosion-puffing system (CEPS) is described. A drying study included moisture distribution throughout a two-stage pilot scale dryer as well as bed temperature during first stage drying. Shrinkage losses of carrots by two dehydration methods were investigated, and volume differences were obtained. Measurements of dried carrot properties such as bulk density, colour, nonenzymatic browning, rehydration, and disintegration were used to determine optimum operating pressure, temperature, and feed moisture for CEPS. Response surfaces developed from these properties were used simultaneously to establish a constrained optimum. AA

POTATO

- 433 THOMAS (P). Involvement of polyphenols in the after-cooking darkening of gamma irradiated potatoes.
J. Food Sci. 46(5); 1981; 1620-21

Peeling of potatoes prior to boiling reduces the intensity of gamma irradiation induced after-cooking darkening of the tuber flesh. Polyphenols in the flesh of cooked whole tubers, pre-peeled tubers and in the cooking water were determined to examine its role in the darkening. Pre-peeling results in increased leaching of polyphenols from the flesh into the cooking water thus reducing the amount available for the formation of iron-phenolics complex responsible for darkening. The results indicate a strong correlation between low polyphenol levels and the reduction in after-cooking darkening of pre-peeled potatoes. AA

SWEET POTATO

- 434 AZHAR (A) and HAMDY (MK). Alcohol fermentation of sweet potato. I. Acid hydrolysis and factors involved.
Biotechnol. Bioeng. 23(4); 1981; 879-86

CASSAVA

- 435 RICKARD (JE) and COURSEY (DG). Cassava storage. Part 1. Storage of fresh cassava roots. Trop. Sci. 23(1); 1981; 1-32

The authors have completely revised and up-dated the earlier review of Ingram and Humphries (1972). They have covered the simple and traditional techniques of storage in clamps, in boxes, or in plastic bags or films) as well as more advanced techniques (such as cold storage, freezing, waxing, and chemical treatments). The importance of mechanical damage and pre-harvest practices has been pointed out. Considerable space has been devoted to the deterioration of quality during storage, including pathological and physiological deterioration, and the symptomatology and aetiology of vascular discolouration. They conclude that successful storage of fresh, cassava roots is likely to be achieved only by various combinations of the methods discussed in this review. KMD

CELERY

- 436 JOHNSON (CE), LINDSAY (RC) and WESSON (JB). Quality of canned celery produced from sliced celery stored under modified atmospheres. J. Food Prot. 43(12); 1980; 924-8

Evaluation of canned samples indicated that the refrigerated (4 C) storage-life of fresh, sliced celery could be extended to at least three weeks by packaging the celery in closed low-density polyethylene bags. Canned celery produced from sliced fresh celery stored under modified atmospheres became progressively firmer. Celery stored in higher barrier bags became darker than celery stored in lower barrier bags. Modified atmospheres during storage at 4 C caused rapid deterioration of raw, sliced celery. VR

ALFALFA

- 437 FIORENTINI (R) and GALOPPINI (C). Pilot plant production of an edible alfalfa protein concentrate. J. Food Sci. 46(5); 1981; 1514-7, 1420

This paper reports the development of a pilot plant scale wet fractionation process to obtain an edible leaf protein concentrate from alfalfa juice by the fractionated recovery of the chloroplastic and cytoplasmatic proteins. The green pigmented fraction is recovered at room temperature by employing an organic polyelectrolyte, while the edible white proteins are coagulated by acidification to pH 4.0. The pilot plant and working conditions are described together with the chemical composition of the final products. Some functional properties of cytoplasmatic protein concentrate are also reported. Since the whole process takes place at room temperature the cytoplasmatic protein concentrate shows good functional properties especially with regard to its nitrogen solubility. AA

CAULIFLOWER

- 438 KATIHA (SM) and AMIT NATH. Note on the estimation of oxydemeton methyl residue in cauliflower. Indian J. Agric. Sci. 52(8); 1982; 549-50

A modified extraction and clean up technique for estimating oxydemeton methyl residues in cauliflower leaves and curds by employing the total P method of Getz and Watts (1964) (J. Assoc. Off. Anal. Chem. 47, 1964, 1096) with minor modifications is reported. Control extracts fortified with 100 µg (2 ppm) 50% technical oxydemeton methyl gave a recovery percentage of 75.00 ± 0.42 . MVG

TOMATO

- 439 DAVIES (JN) and HOBSON (GE). The constituents of tomato fruit. The influence of environment, nutrition and genotype. CRC Crit. Rev. Food Sci. Nutr. 15(3); 1981; 205-80
Discusses: history; classification; anatomy of the flower and fruit; tomato production; quality and international grading standards; basic composition and dry matter analysis; sugars; ascorbic acid (Vitamin C); organic acids; phenolic components; amino acids; other nitrogenous compounds, nitrate and ammonia; cell wall constituents; proteins and enzymes; pigments; the non-ripening mutants; volatile constituents; alkaloids; and storage. BSN
- 440 DANIEL LUIS PEDRERO, CARROAD (PA) and O'BRIEN (M). Relationship among percentage of grass green tomatoes and comminuted sample readings for grading processing tomatoes. J. Food Process. Preserv. 5(4); 1981; 215-25
Over 1000 truck loads of processing tomatoes were studied at a California State grading station to determine the relationships among percentage of grass green tomatoes, Agtron colour reading of the comminuted sample, and soluble solids concentration of the comminuted sample. Recorded data were characterized by tomato shape, and with respect to seasonal and time of day variation. No significant correlations were achieved among the variables as currently measured, although general trends of increased redness and solids concentration over the season were as expected. AA
- 441 HOBSON (GE). The short-term storage of tomato fruit. J. Hortic. Sci. 56(4); 1981; 363-8
The feasibility of using alternating temperatures of 2 C and 20 C to delay the ripening of mature tomatoes without adversely affecting appearance or taste of the ripe fruit was investigated. A 24 hour respite at 20 C was given after 1-6 days at 2 C, and the treatment continued for 1-4 weeks after which the fruits were returned to 20 C. Cyclical temperature regimes invariably led to loss of quality. As an alternative technique, green-orange fruits were enclosed in polyethylene and kept at several temperatures below ambient. The build-up of modified atmospheres extended the ripening time, improved firmness and maintained quality. Under some storage conditions fruit decay reached unacceptable levels, but if short-term storage at a moderately low temperature was combined with restricted gas-exchange, this could form the basis of an effective low-cost system. AA
- 442 DALE (MC), LESLEY (DR), OKOS (M) and NELSON (P). Effects of insulation on the extent of freezing of tomato products stored in aseptic bulk storage tanks. J. Food Sci. 46(5); 1981; 1546-51
A finite difference model was developed to determine the effects of insulation on the extent of freezing of tomato puree stored in aseptic bulk storage silos exposed to winter weather conditions. The model was validated using data obtained from the freezing and thawing of a small cylinder of tomato puree. Density, heat capacity, and thermal conductivity were written as functions of temperature, percent solids, and percent ice fraction. Storing high percent solids or a small amount of insulation could greatly reduce the extent of freezing in a silo. Three inches of foam type insulation were sufficient to prevent freezing of 8.5% solids tomato puree for a severe winter (1979) in the northeastern region of Indiana using temperatures and wind speeds collected by the Ft. Wayne, IN weather station. One inch of insulation was sufficient to prevent freezing in 21% solids tomato puree. AA

- 443 JUVEN (BJ) and WEISSLOWICZ (H). Chemical changes in tomato juices caused by lactic acid bacteria. J. Food Sci. 46(5); 1981; 1543-5

In an attempt to use specific bacterial metabolites in a monitoring system to detect initial signs of spoilage of tomato products, the changes in bacterial counts, pH, titratable acidity and the accumulation of lactic acid, hydrogen peroxide, diacetyl (DA) and acetoin (AMC) in tomato juices inoculated with *Lactobacillus plantarum*, *L. fermentum* and *Leuconostoc mesenteroides*, were studied. Of the metabolites tested, it appears that DA and AMC can be taken as valuable indicators of contamination of tomato juice by lactic acid bacteria at early stages but not at advanced stages of bacterial growth. AA

- 444 GERSCHENSON (LN), BARTHOLOMAI (GB) and CHIRIFE (J). Structural collapse and volatile retention during heating and rehumidification of freeze-dried tomato juice. J. Food Sci. 46(5); 1981; 1552-6

The effects of temperature, moisture content, and pectin addition on the "collapse" of freeze-dried tomato juice cake and retention of volatiles were investigated. High temperatures and high moisture contents induce collapse and the loss of volatiles, which was measured with ¹⁴C-labelled butyl acetate. The addition of pectin, which enhances the viscosity of the tomato juice, increases its "collapse" temperature after freeze-drying and the retention of volatiles. AA

CHILLI

- 445 RAHMAN (FMM) and BUCKLE (KA). Effects of blanching and sulphur dioxide on ascorbic acid and pigments of frozen capsicums. J. Food Technol. 16(6); 1981; 671-82

The frozen storage of capsicum tissue for 1 year at -12 C resulted in appreciable losses (from 10 to 58%) of ascorbic acid dependent upon the cultivar and the extent of tissue blanching. Ascorbic acid retention was maximal, but retention of chlorophyll a was minimal and pH dependent, in frozen blanched tissue which accordingly showed a greater increase in pheophytin formation. Sulphite treatment of unblanched tissue maintained acceptable colour through retardation of degradative interconversion and isomerization reactions of chlorophyll and carotenoid pigments during frozen storage. AA

- 446 SINGH (KP), PANDEY (SY) and SINGH (S). Aldicarb residues in red chillies. Indian J. Agric. Sci. 52(11); 1982; 776-8

Chillies (*Capsicum frutescens* Linn) crop was treated with 10% granular application of aldicarb at the rate of 0.50 to 1.50 kg active ingredient/ha as basal and side dressing during winter (Rabi) and rainy season of 1979. Fresh and dry chillies when analysed colorimetrically at harvest showed aldicarb residue of 0.05-0.13 and 0.05-0.18 ppm respectively. MVG

BREADFRUIT

- 447 PASSAM (HC), MAHARAJ (DS) and PASSAM (S). A note of freezing as a method of storage of breadfruit slices. Trop. Sci. 23(1); 1981; 67-74

Trinidad breadfruit (*Artocarpus altilis* (Park.) Fosberg) of a local "Whiteheart" cultivar, when enclosed in polythene, could be stored in a fresh marketable state at 14 C for up to 10 days. Inclusion of an ethylene oxidizing agent within the polythene did not significantly improve storage. In contrast, segments of peeled breadfruit which had been boiled for a short period (2-5 minutes, optimally) and then frozen at

-15 C, stored satisfactorily for a period of at least 11 weeks. On cooking, frozen samples compared favourably in flavour, colour, and texture with fresh breadfruit. KMD

FRUITS

- 448 WHITE (GW) and SHENTON (AJ). Food microscopy (An annotated bibliography), Part III F. Fruit and nuts.
J. Assoc. Public Anal. 20(Pt.1); 1982; 25-9
- 449 VAMOS-VIGYAZO (L). Polyphenol oxidase and peroxidase in fruits and vegetables.
CRC Crit. Rev. Food Sci. Nutr. 15(1); 1981; 49-127
Discusses: polyphenol oxidase; polyphenol oxidase and its substrates in some fruits and vegetables; and peroxidase (food). BSN

KIWIFRUIT

- 450 ROBERTSON (GL) and SWINBURNE (D). Changes in chlorophyll and pectin after storage and canning of kiwifruit.
J. Food Sci. 46(5); 1981; 1557-9

BANANA

- 451 BALDRY (J), COURSEY (DG) and HOWARD (GE). The comparative consumer acceptability of triploid and tetraploid banana fruit.
Trop. Sci. 23(1); 1981; 33-66
Despite the differences that exist between the triploid "Cavendish" clones, such as "Valery" which make up the bulk of the present trade in dessert bananas, and the tetraploid clones, the latter were found to be as acceptable as the triploid fruits. The organoleptic testing was done by a scored descriptive analysis taste panel. KMD
- 452 GALEAZZI (MAM) and SGARBIERI (VC). Substrate specificity and inhibition of polyphenoloxidase (PPO) from a dwarf variety of banana (*Musa cavendishii*. L.)
J. Food Sci. 46(5); 1981; 1404-6
Banana polyphenoloxidases oxidize specifically o-diphenols. The Km values were low for dopamine, epinephrine, and norepinephrine. It was lower for L-dopa as compared with D-dopa. The most effective inhibitor was ascorbic acid followed by cysteine and then sodium metabisulphite. Diethyldithiocarbamate, at pH 7.0, was not as effective as the above inhibitors. Ammonium ion and the oxidized β -nicotine adenine dinucleotide acted as activators whereas Fe^{+2} , Fe^{+3} , Al^{+3} , Ca^{+2} and Zn^{+2} showed various degrees of inhibition. On the other hand, Cu^{+1} , Cu^{+2} , Mg^{+2} and Mn^{+2} did not affect the enzyme activity. Mercaptoethanol (17 mM) completely inactivated the enzymes. On dialysis 30% of the activity was restored with regeneration of two isozymes. AA
- 453 MAO (WW) and KINSELLA (JE). Amylase activity in banana fruit: Properties and changes in activity with ripening.
J. Food Sci. 46(5); 1981; 1400-403
Following subcellular fractionation and centrifugation, the amylase activity was located in the cytosol fraction of banana fruit. Over 80% of the observed activity (15-20 units per mg of protein) was attributed to α -amylase. The activity of β -amylase was tenfold lower and starch phosphorylase activity was low (17 μg inorganic phosphorus released per mg protein per 24 hours). The activity of amylase in crude preparations was stimulated 40% by calcium ions. The amylase preparation, which was very stable at 4 C, hydrolyzed soluble potato starch and banana starch at similar rates. Maximum activity was observed between pH 6-7. The energy

of activation of hydrolysis was 9.74 Kcal/mole. Amylase was quite active up to 62 C but rapidly lost activity above this temperature. There was an approximate twofold increase in amylase during the initial phase of ripening. AA

CITRUS

- 454 RAMANA (KVR), GOVINDARAJAN (VS) and RANGANNA (S). Citrus fruits - Varieties, chemistry, technology and quality evaluation. Part I: Varieties, production, handling and storage. CRC Crit. Rev. Food Sci. Nutr. 15(4); 1981; 353-431

Discusses: classification of citrus fruits; breeding; citrus die-back disease; production of fruits; fruits grown in different parts of the world; factors affecting composition; of fruits; changes in composition during growth and maturation; maturity standards for harvest; harvesting; handling, packaging and transport; storage aspects; physiological disorders in fruits; postharvest diseases and their control; and changes in chemical constituents during storage. BSN

- 455 PARK (GL) and NELSON (DB). HPLC analysis of sorbic acid in citrus fruit. J. Food Sci. 46(5); 1981; 1629, 1631

A method for the determination of sorbic acid (2,4-hexadienoic acid) in citrus fruit is described. The method consists of extraction of the peel with methanol, clean-up of the extract by solvent partitioning and column chromatography, and quantitative determination by reverse-phase HPLC using UV detection. The method is applicable to orange, lemon, and grapefruit and the detection limit 0.5 ppm. Analysis of fruit fortified with 1-10 ppm sorbic acid indicated an average recovery of 95.6% with a coefficient of variance of 2.9%. AA

ORANGE

- 456 KANNER (J), HAREL (S) and BEN-SHALOM (N). Ascorbate oxidase in mature orange peel. J. Food Sci. 46(5); 1981; 1407-9

Evidence of the occurrence of ascorbic acid oxidase in the peel of mature orange is presented. The enzyme was found to be insoluble and located in albedo only. It is specific for ascorbic acid but not for catechol and is oxygen-dependent, with pH optimal activity of 6.5. The ascorbic acid oxidase activity was inhibited by high temperature, a pH below 3.5, and copper-chelates such as sodium azide and sodium dithiocarbamate. Blanching and decreasing the pH of the peel to 3.5 are recommended to achieve maximum stability of ascorbic acid in orange peel. AA

- 457 SUBRAHMANYAM (KV) and MOHANDOSS (V). Economic evaluation of coorg mandarin (orange) in Karnataka. Indian J. Agric. Econ. 37(1); 1982; 70-76

Out of the 64,337 acres under citrus crops in Karnataka State (S. India) during 1975-76, 48,078 acres are under Coorg mandarin. The latter is mostly grown as a shade tree in the coffee estates in Coorg district. The authors have tried. (i) to assess the costs and returns from Coorg mandarins, (ii) to determine the profitability of Coorg mandarins through different investment appraisal methods, and (iii) to suggest the best method of evaluating the orchards. An inter-crop of mandarins yielded a better return than a pure crop; it yielded a return of nearly 30%, and a benefit/cost ratio greater than 2.0. The pay-back period of 9 years (compared to 7 years for Nagpur "Santra") is a little high, but is compensated by a productive life of more than 40 years. The plants are worth retaining as long as they give an income of Rs. 108 over maintenance cost, which is quite low. Regarding the method of economic appraisal, the annual amortization method seems to be preferable to the present value summation method, because of its simplicity, equal efficiency, and closeness to results in a real situation. KMD

MANG O

- 458 SHANTA KRISHNA MURTHY, GOPALA KRISHNA RAO (KP) and ONKARAYYA (H). Storage of mango pulp in bulk and consumer packs. Indian Food Packer. 36(1); 1982; 32-8

Suitability of different types of packs for storing mango pulp in bulk and consumer packs has been investigated. Alphonso and Totapuri mango pulp can be stored in bulk and consumer packs of HDPE containers, glass bottles, polyethylene and polypropylene pouches available in the country for a period 2-12 months using low temperature storage and preservatives. The spoilage of pulp was mainly by a heterofermentative *Lactobacillus bacterium* even though some yeasts and moulds were present. AA

PEACH

- 459 SINGH (BP), GUPTA (OP) and CHAUHAN (KS). Effect of pre-harvest calcium nitrate spray on peach on the storage life of fruits. Indian J. Agric. Sci. 52(4); 1982; 235-9

The main effects of different concentration of calcium nitrate as pre-harvest spray on peach (*Prunus persica*. Batsch) was manifested through minimum loss in weight, reduced rate of respiration and disease percentage and finally maintained the edible quality in terms of TSS, acidity, TSS to acid ratio and vitamin C of fruits for 6 days under storage. The non-treated fruits remained in acceptable conditions for 2 days only. Pre-harvest spray with 1% calcium nitrate prolonged the storage life of fruits due to delayed onset of senescence. AA

- 460 SCHWEINGRUBER (PJ), CARROAD (PA), LEONARD (SJ), HEIL (JR), WOLCOTT (TK), O'MAHONY (M) and WILSON (A). Evaluation of instrumental methods for firmness measurement of fresh and canned clingstone peaches. J. Texture Stud. 12(3); 1981; 389-99

The firmness of fresh and canned clingstone peaches was investigated using blade extrusion, back extrusion, and shear-compression instruments. The three techniques yielded results which correlated well among themselves and to sensory evaluation of peach firmness. Results indicate that high vacuum flame sterilization yields a canned product which is closer in firmness to fresh peaches than is the conventionally retorted product. AA

- 461 KASHYAP (NP) and HAMEED (SF). Residue of some organophosphorous insecticides on peach fruits at harvest. Indian J. Agric. Sci. 52(1); 1982; 10-13

Peach (*Prunus persica* Linn. Var. Webcock) fruits from trees sprayed 0.05% levels of fenitrothion, fenthion, malathion, methyl-parathion and trichlorphon were examined for insecticide residues at harvest by bio-assay and chemical methods. The safety intervals (persists that should lapse between treatment and harvest of the fruits following insecticide sprays) were 14-16 days at fenitrothion, 11-13 days in trichlorphon, 10-12 days in fenthion, 9 days in methyl-parathion and 1-2 days in malathion. All the residues were within acceptable limits at the time of harvest. MVG

SAPO TA

- 462 DURRANI (SM), PATIL (VK) and KADAM (BA). Effect of N, P and K on growth, yield, fruit quality and leaf composition of sapota. Indian J. Agric. Sci. 52(4); 1982; 231-4

In 8 year-old 'Kali Patti' trees of sapota (*Achras zapota* Linn.) planted at a distance of 12 m, application of 800 g N/tree, significantly increased the trunk-girth and weight and number of fruits. The combined application of 800 g N plus 176 g P plus 166 g K/tree was optimum for maximum fruit yield. Pulp to seed ratio increased significantly with

increased P and K levels and also by the combined application of N, P and K. The total soluble solids in fruits increased significantly with the individual as well as combined application of N, P and K. AA

- 463 INGLE (GS), KHEDKAR (DM) and DABHADE (RS). Effect of growth regulators on ripening of sapota fruit (*Achras sapota* Linn.) Indian Food Packer. 36(1); 1982; 72-7

Sapota fruits were treated with ethrel at 1000-5000 ppm with 2,4-D at 2-5 ppm levels and were packed in polyethylene bags (125 gauge, 30 x 15 cms² size with 12 vents) either as such or after treating with wax emulsion (Waxol-0). Ethrel treatment gave uniform ripening compared to other treatments. Ethrel at 5000 ppm enhanced the ripening and helped to ripen the fruit within 3 days. Treatment of sapota fruit with 2, 4-D and wax emulsion effectively retarded the ripening process and prolonged the storage life of fruit up to 12 days. The physiological loss in weight at eating ripe stage was higher in ethrel treated fruits as compared to fruits ripened in paddy straw. The latter had maximum organoleptic score. Next best was with 3000 ppm ethrel. The organoleptic score for 5000 ppm ethrel and 2,4-D at 5 ppm was below the acceptable limit. AA

GUAVA

- 464 NAGAR (PK) and RAJA RAO (T). Gibberellin-like substances in seedless guava (*Psidium guajava* L.) fruit. J. Hortic. Sci. 56(4); 1981; 339-43

SUGAR, STARCH AND CONFECTIONERY

- 465 YADAV (RL) and SHARMA (RK). Yield and pattern of sugar accumulation in sugarcane planted in autumn and spring. Indian J. Agric. Sci. 52(7); 1982; 452-8

In a field experiment during 1977-79 and 1978-80, it was found that autumn-planted cane produced higher yields of sugar than spring-planted one. The seasonal difference in yield were wider when harvested in the beginning of the sugarcane crushing season; they were narrower when harvested late during the crushing season. The autumn crop got ready for harvesting earlier than spring crop. Sugarcane maturity increased with lower rates of N application. MVG

- 466 ANON. Modified starches. A report on the review of the food additives and contaminants committee. Br. Food J. 83(901); 1981; 42-3, 53

The report on review of the food additives and contaminants committee covers the following aspects: uses of starches; structure and properties; modified starches; definitions; and permitted list system. BSN

CONFECTIONERY

- 467 CHAKRAVARTI (RN). Dietary position of some Bengal sweets. J. Inst. Chem. (India). 54(IV); 1982; 149-50

BAKERY PRODUCTS

BREAD

- 468 LAWRENCE (JF), IYENGAR (JR) and CONACHER (HBS). Gravimetric determination of ethoxylated mono- and diglycerides in bread. J. Assoc. Off. Anal. Chem. 64(6); 1981; 1462-4

A gravimetric method is described for the quantitative determination of ethoxylated mono- and diglycerides (EMGs) in bread at levels as low as 0.42% (dry sample). The air-dried pulverized samples are Soxhlet-extracted 22 hour with an azeotropic mixture of n-propanol-water. The contents are evaporated to dryness, and then treated with 5% HCl in methanol to trans-esterify the fatty acids present which are then removed by petroleum ether extraction. The EMGs are subsequently precipitated from aqueous solution with phosphomolybdic acid in the presence of barium ions. The precipitate is weighed and compared with known amounts of standard carried through the same procedure. AA

- 469 KULP (K) and PONTE (JG) Jr. Staling of white pan bread: Fundamental causes.

CRC Crit. Rev. Food Sci. Nutr. 15(1); 1981; 1-48

Discusses: tests of staleness; molecular basis of staling; factors involved; flour components; enzymes; antistaling additives; and flavour changes associated with staling. BSN

BISCUIT

- 470 SATHE (SK), TAMHANE (DV) and SALUNKHE (DK). Studies in saltine crackers (Khara biscuits): I. Composition and certain physicochemical changes during baking.

Cereal Food World. 26(8); 1981; 404-6

Physicochemical and organoleptic evaluation of commercially manufactured crackers in India indicated a wide range of variation in composition. Average weight per cracker ranged from 4.1 to 22.0 g. Fat analyses of commercially prepared crackers (25.00-40.95%) indicated that the texture of the crackers was at least partially dependent on fat content. When the preparation of crackers was standardized under laboratory conditions, 60 g of fat per 100 g of wheat flour was found to yield quality crackers. No form of aeration (chemical or biological) was necessary for the production of these crackers. Dextrinization of starch during baking appeared to be a function of fat content and to be at the expense of amylose. Heat destruction of lysine increased with increasing fat content of the crackers. AA

- 471 SATHE (SK), TAMHANE (DV) and SALUNKHE (DK). Studies in saltine crackers (Khara biscuits): II. Protein enrichment and storage stability.

Cereal Food World. 26(8); 1981; 407-9

Saltine crackers (Khara Biscuits) were prepared with three different fats (vegetable fat, aerated bakery fat, and nonaerated bakery fat), each at four levels. The crackers were then stored in two different storage conditions (28 C, 62.5% rh and 40 C, 70% rh) and evaluated for moisture uptake and rancidity development. Moisture uptake at 40 C was less than at 28 C. Crackers containing the cooking vegetable fat developed rancidity in 30 days under the storage environment investigated. The crackers containing the aerated and nonaerated bakery fats, on the other hand, developed rancidity after 60 days of storage at 28 C and 62.5% rh but were not rancid when stored for 60 days at 40 C and 70% rh. Protein quality was improved by incorporation of casein, cheese powder, soy flour, or groundnut flour. AA

CAKE

- 472 MARTIN (DJ) and TSEN (CC). Baking high-ratio white layer cakes with microwave energy.

J. Food Sci. 46(5); 1981; 1507-13

Microwave energy was evaluated as a means of baking high-ratio white-layer cakes by considering the effects of various processing conditions and amounts of ingredients. Minimal water in cakes baked with microwave energy did not result in surface collapse as with cakes baked by conventional means. As the amount of mono-calcium phosphate monohydrate in

the baking powder blend was increased, volume and specific volume decreased and crumb firmness and internal score increased. There was no evidence of any significant internal nor surface batter flow in the conventional cake while in the microwave cake considerable batter flow was observed on the surface and internally in the upper central regions of the cake. Scanning electron micrograph showed differences in cell structure between both types of cake. The cells in the centre of the cake baked with microwave energy were more irregular and had thicker cell walls than the conventional cake. AA

MILK AND DAIRY PRODUCTS

- 473 PANDEY (P). Dairying in Mauritius.
Indian Dairyman. 34(10); 1982; 157-8
The trend in milk production in Mauritius since 1964 has been reviewed along with the causes for the decreased production. The dairy products currently being produced are briefly outlined as also the measures taken by the government to effect overall improvements in the dairy industry. MVG
- 474 BASU (P). Effective organisational set up for the dairy industry.
Indian Dairyman. 34(3); 1982; 125-9
Current status of dairying in India; need for proper development of rural dairying infrastructure, establishment of coordination between various developmental organisations, Proper credit policy to meet the needy farmers; need based in-put package in rural environment, manpower development; and concept of a centralized structure as followed in Gujarat Dairy are the aspects covered. MVG
- 475 BYWATER (AC). Development of integrated management information system for dairy producers.
J. Dairy Sci. 64(10); 1981; 2113-24
- 476 FREEMAN (AE). Breeding inputs to managerial goals in dairy production.
J. Dairy Sci. 64(10); 1981; 2105-12
- 477 ADAMS (DM) and BRAWLEY (TG). Heat resistant bacterial lipases and ultra-high temperature sterilisation of dairy products.
J. Dairy Sci. 64(10); 1981; 1951-7
- 478 CHAUDHRY (BK). Productivity in coordinated quality control.
Indian Dairyman. 34(3); 1982; 121-3
The paper deals with quality control with special reference to dairy industry. Aspects covered include the personnel involved in quality control, their coordination, factors which influence productivity in quality control department like location, space, equipment and personnel and finally improving productivity in co-ordinated quality control effort. MVG
- 479 SAXENA (YK). Effluent treatment in dairy industry.
Indian Dairyman. 34(10); 1982; 169-71
Various source of dairy effluents, their treatment and pollutional effects are discussed. MVG

MILK

- 480 CHAKRABORTHY (BK). Productivity enhancement in dairy management with particular reference to liquid milk handling, marketing and product manufacture.
Indian Dairyman. 34(10); 1982; 133-6

Various technological options available for developing a basic strategy for liquid milk and their products at the top management level and at the operational management level have been reviewed. MVG

- 481 BABB (EM). Analysis of regional milk prices and production costs. J. Dairy Sci. 64(10); 1981; 2043-7
- 482 MOORE (RK), HIGGINS (S), KENNEDY (BW) and BURNSIDE (EB). Relationships of teat conformation and udder height to milk flow rate and milk production in Holsteins. Can. J. Anim. Sci. 61(2); 1981; 493-501
- 483 BRISSENDEN (CH). Energy saving in evaporation and drying. Indian Dairyman. 34(2); 1982; 45-56
The author after considering the need for energy saving in evaporation and drying of milk in India has reviewed the present situation in India. Suggestions given for energy saving in evaporation include effecting changes in this existing evaporator or to instal a mechanical vapour re-compression (MVR) evaporator. Energy saving in spray drying could be achieved by preheating concentrated milk, increasing the air-inlet temperature and using two stage drying. Another alternative is reverse osmosis followed by MVR evaporation. MVG
- 484 HOLT (C). Some principles determining salt composition and partitioning of ions in milk. J. Dairy Sci. 64(10); 1981; 1958-64
- 485 POWELL (RL) and NORMAN (HD). Changes in predicted difference milk with increased repeatability. J. Dairy Sci. 64(10); 1981; 1972-7
- 486 MANGINO (ME) and FREEMAN (NW). Statistically reproducible evaluation of size of casein micelles in raw and processed milks. J. Dairy Sci. 64(10); 1981; 2025-30
Several procedures were evaluated to determine mean micelle diameters and size distributions in raw and processed milks. Fixation in buffered glutaraldehyde followed by formation of a parliodon replica proved to yield the most statistically reliable data. By this procedure, 95% confidence intervals could be established, and, thus treatment effects on micelles size could be analyzed statistically. AA
- 487 MUNRO (PA), DUNNILL (P) and LILLY (MD). Casein hydrolysis in stirred tank reactors using chymotrypsin immobilized on magnetic supports. Biotechnol. Bioeng. 23(4); 1981; 677-89
- 488 LONERGAN (DA), FENNEMA (O) and AMUNDSON (CH). Stability of proteins in ultrafiltered, low-lactose milk concentrate during frozen storage. J. Food Sci. 46(5); 1981; 1603-11
Casein in concentrated milk (3X) destabilizes after 1-3 weeks at -8 C. Use of an ultrafiltration (UF) process to partially remove lactose from milk, followed by replacement of all or part of the removed lactose with corn syrup, glucose or sucrose can greatly extend protein stability. Protein stability improves as the amount of nonlactose carbohydrate is increased and the amount of lactose is decreased. Although nutritionally significant amounts of minerals and vitamins are removed by this process, they can be easily replaced. Samples of skim and whole milk from which 68-72% of the lactose is removed by UF and replaced on an equal weight basis with corn syrup are stable for more than 34 weeks at -8 C. AA
- 489 CHEN (S-LY), FRANK (JF) and LOEWENSTEIN (M). Estimation of lactose hydrolysis by freezing point measurement in milk and whey substrates treated with lactases from various microorganisms. J. Assoc. Off. Anal. Chem. 64(6); 1981; 1414-9

- 490 RANHOTRA (GS), GELROTH (JA), TORRENCE (FA), BOCK (MA) and WINTERRINGER (GL). Bioavailability of iron in iron-fortified fluid milk. J. Food Sci. 46(5); 1981; 1342-4

The bioavailability of iron in pasteurized and homogenized cow's milk was determined by the hemoglobin depletion-repletion technique using rats. A water soluble citrate phosphate iron complex (iron, 16.67%) was used to fortify milk (iron, 38 ppm). Results showed that iron in milk was as well available as that in ferrous sulphate (99% vs 100%); the same was true when the iron complex was tested as such (not added to milk). Thus, milk or milk components appear not to adversely affect the bioavailability of added iron under the conditions of this experiment. AA

- 491 de MAN (JM). Light-induced destruction of vitamin A in milk. J. Dairy Sci. 64(10); 1981; 2031-2

The vitamin A content of whole, 2% and skim milk was determined before and after exposure to 2200 lx intensity fluorescent light for up to 48 hours at refrigerator temperature. The milk was packaged in plastic pouches. Vitamin A of whole milk dropped to 67.7% of its original content after 30 hours and remained constant for a further 18 hours. In 2% milk it dropped to 23.6% and in skim milk to 4.2% of the original content. The 2% milk had an original vitamin A content about twice as high as that of whole or skim milk. AA

- 492 OZIMEK (G), POZNANSKI (S) and CICHON (R). Influence of selected factors on functional properties of textured milk proteins. J. Food Technol. 16(6); 1981; 575-85

Studies were made on the influence of two variable factors - fat content and added salt - on the following functional properties of textured milk proteins: water absorption capacity, thermal shrinkage, consistency, viscosity, fat absorption, emulsifying capacity and emulsion stability. Variation in fat content of the product (11% and 15%) was obtained by introducing various amounts of fat to skim milk in the course of the production of textured milk proteins. The salt concentration of the preparation was modified by adding sodium chloride, Hamine polyphosphate mixture or both those salts jointly. The results indicate that the functional properties of the preparation were influenced by the two above mentioned factors in a statistically significant manner. The higher fat content of the product (15%) was accompanied by better fat emulsifying capacity and emulsion stability and lower thermal shrinkage. The salts used for these studies were found to influence favourably the functional characteristics of the preparation. The addition of sodium chloride appears to be most expedient, as it improves important technological properties such as fat absorption and emulsifying capacities. AA

- 493 RAO (DR), CHAWAN (CB) and PULUSANI (SR). Influence of milk and *Thermophilus* milk on plasma cholesterol levels and hepatic cholesterogenesis in rats. J. Food Sci. 46(5); 1981; 1339-41

- 494 PRICE (RL), JORGENSEN (KV) and BILLOTTE (M). Citrus artifact interference in aflatoxin M₁ determination in milk. J. Assoc. Off. Anal. Chem. 64(6); 1981; 1383-5

Dried citrus waste was fed to dairy cows, their milk was extracted, and aflatoxin M₁ was quantitated by using both high pressure liquid chromatography (HPLC) and thin layer chromatography (TLC). Results indicate that a compound from the citrus waste, which is excreted into the milk, interferes with the HPLC determination of aflatoxin M₁ in milk and causes a false positive test. This interference can be overcome by using TLC with proper selection of developing solvents. AA

- 495 BASU (AK). Studies on the development of lactic acid in pasteurised recombined milk and natural milk at different temperature at Central Dairy, Calcutta. J. Inst. Chem. (India). 54(III); 1982; 107-8

(i) Recombined milk (prepared from imported butter oil and skimmed milk powder) and (ii) natural milk were stored at temperature of 6 ± 2 , 20 ± 2 , and 30 ± 2 C, and the production of lactic acid was followed. After 12 hours of storage, no lactic acid could be measured in (i) and (ii) stored at 6 C; but at 20 C, the lactic acid content, was 0.125-0.15% in (i) and 0.15-0.18% in (ii). Acidity developed within 6 hours in (ii) stored at 30 C and increased to 0.18-0.22% after 12 hours in (i) stored at 30 C, no acidity was measured after 6 hours and after 12 hours the acid was only 0.17-0.19%. About 90-95% of the acidity that developed in all the milk samples was due to lactic acid. KMD

- 496 NEWSTEAD (DF) and HEADIFEN (JM). A reappraisal of the method for estimation of the peroxide value of fat in whole milk powder. NZ. J. Dairy Sci. Technol. 16(1); 1981; 13-8

The method for determination of the peroxide value of the fat in whole milk powders has been re-examined with a view to improving the reliability of the results obtained. The importance of carrying out the fat extraction under reduced lighting is emphasized. Extraction in the light gave to double the peroxide values obtained when most of this procedure was undertaken in darkness. AA

- 497 KAPSIMALIS (DJ) and ZALL (RR). Ultrafiltration of skim milk at refrigerated temperatures. J. Dairy Sci. 64(10); 1981; 1945-50

Effects of temperature and membrane pore size on permeation flux rates and microbial quality of retentates and permeates during ultrafiltration of skim milk were investigated. Skim milk was ultrafiltered at 15 and 45 C with either small pore (10,000 molecular weight cut-off) or large pore (50,000 molecular weight cut-off) membranes. Standard plate counts of the retentates obtained during ultrafiltration at 15 C were lower than standard plate counts at 45 C. Permeation flux rates were almost four times greater at 45 than at 15 C with both small and large pore membranes. AA

- 498 MINSON (EI), FENNEMA (O) and AMUNDSON (CH). Accelerated tests for evaluating protein stability in frozen skim milk. J. Food Sci. 46(5); 1981; 1592-6

Skim milk was diafiltered (DF) to remove about 90% of the lactose, and major salts and vitamins were restored to normal levels. Protein stability at -9 C was monitored using two accelerated test procedures. One involved DF skim milk containing a normal level of carbohydrate and 3.9 times the normal level of calcium, and the other involved DF skim milk containing a normal level of calcium and one-half the normal level of carbohydrate. Both approaches resulted in casein instability in about 1 week at -9 C. These test procedures should be useful for rapidly assessing the effects of additives or processing on the stability of casein in frozen skim milk. AA

- 499 MINSON (EI), FENNEMA (O) and AMUNDSON (CH). Efficacy of various carbohydrates as cryoprotectants for casein in skim milk. J. Food Sci. 46(5); 1981; 1597-602

Diafiltered skim milk of two compositions (high-calcium, normal carbohydrate and normal-calcium, reduced carbohydrate) was used as media for testing the efficacy of various carbohydrates and glutamic acid as cryoprotectants for casein in skim milk stored at -9 C. In both test media, 1,3-butanediol, 1,4-butanediol, and ethylene glycol were among the most effective cryoprotectants, and raffinose, glucose, sucrose, and xylose were among the least effective. Glutamic acid, tested in only one medium, was also highly effective. Cryoprotective efficacy was strongly related to a compound's ability to depress the freezing point and to offer many hydrogen bonding sites per molecule. AA

YOGURT

- 500 TAMIME (AY) and DEETH (HC). Yogurt : Technology and Biochemistry. J. Food Prot. 43(12); 1980; 939-77

This important review considers the physical and chemical changes which occur during yogurt manufacture as a result of processing and microbial fermentation. Changes produced during processes, such as heat treatment and physical manipulations are reviewed. Microbial fermentation is discussed in terms of the characteristics of the yogurt organisms, *Lactobacillus bulgaricus* and *Streptococcus thermophilus* and the biochemical reactions involved in carbohydrate metabolism, flavour production, proteolysis and lipolysis. AA

- 501 LABROPOULOS (AE), PALMER (JK) and LOPEZ (A). Whey protein denaturation of UHT processed milk and its effect on rheology of yogurt. J. Texture. Stud. 12(3); 1981; 365-74

The denaturation of whey proteins in whole milk during processing by the indirect UHT and vat systems was determined. Whey protein denaturation plateaued at about 88% following a UHT heat treatment of 149 C for 10 seconds. However, it reached about 88% with a vat heat treatment of 82 C for 5 minutes and reached 95 to nearly 100% after 10 to 15 minutes. Vat processing under pasteurizing conditions at 63 C for 30 minutes resulted in less than 10% denaturation. The yogurts prepared from the vat processed milk had considerably higher structural firmness than those prepared from the UHT milk, as confirmed by the lower value of curd firmness and the higher shear stress of these yogurts. It was also found that the structural or curd firmness of yogurts prepared from UHT milk was highest when the milk was processed for 3.3 second process holding time and was lower when the milk was processed for longer or shorter process holding times. The results suggest that the vat process at 63 C or 82 C brings about a specific change in the whey protein which leads to formation of a firm structure. This change apparently does not occur during the brief UHT treatment. AA

CHEESE

- 502 CHANDRA MOHAN (M), RAO (BVR) and VENKAYYA (D). Shelf life and acceptability of creamed cottage cheese from buffalo milk. Indian Food Packer. 36(1); 1982; 85-90

Creamed cottage cheese from buffalo milk incorporated with sodium propionate at (a) 0.05% and (b) 0.01% and sorbic acid at (c) 0.05% and (d) 0.10% and packed in wax coated cups and wrappers dipped in 1% sorbic acid or 12% sodium propionate solution were stored at refrigeration temperature to study the inhibition of microorganisms during their storage life. In addition, flavour scores were also recorded to assess their consumer acceptability levels. Based on data reported for titratable acidity levels, multiplication of yeast and moulds and organoleptic quality (d) packed in containers treated with 1% sorbic acid solution was found better than (a), (b) and (c) packed in containers dipped in 12% sodium propionate solution. AA

- 503 SALJI (JP) and KROGER (M). Proteolysis and lipolysis in ripening cheddar cheese made with conventional bulk starter and with frozen concentrated direct-to-the-vat starter culture. J. Food Sci. 46(5); 1981; 1345-8

Samples taken at the beginning and after 1, 2, and 3 week of ripening were assayed for total dipeptidase activity and individual free amino acids. Protein dye-binding values and fat acidity titers were used to assess and monitor proteolysis and lipolysis at 4 days and 1, 2, 3, 6, 9 and 12 months. Results indicated higher dipeptidase activity in the bulk starter cheese for the first 3 weeks of ripening. Total free amino acids at the initial stages of cheese ripening were slightly lower in the cheeses made with the frozen concentrated culture. Studies using the

protein-dye binding technique showed significantly higher dye binding capacity by the 3-month-old cheese made with the bulk starter. The differences, however, became minimal in cheeses at 6, 9, and 12 months of age. Higher fat acidity levels were also obtained in the 3, 6, 9, and 12 month cheeses made with the bulk starter. AA

- 504 SAXBY (MJ), CHAYTOR (JP) and REID (RG). Changes in the levels of 2-phenylethylamine in cheese and chocolate during processing and storage. Food Chem. 6(4); 1981; 281-8

Amines from cheese and chocolate were extracted with solvent and separated from non-basic material on an ion-exchange column. The amines were reacted with trifluoroacetic anhydride after the addition of aminotetrahydronaphthalene as an internal standard. The derivatives were analysed on a SCOT column by gas chromatography. The levels of phenylethylamine increased in cocoa beans during fermentation and roasting. Some samples of cheese contained phenylethylamine, whereas others prepared aseptically did not. AA

MEAT AND POULTRY

- 505 WILSON (LL) and STRINGER (WC). Meat production from forages in the Northeast. J. Dairy Sci. 64(10); 1981; 2071-82

- 506 TALMON (Y) and DAVIS (HT). Analysis of propagation of freezing and thawing fronts. J. Food Sci. 46(5); 1981; 1478-83, 1488

The modified isotherm migration method (MIMM) is used to calculate the temperature profiles and freezing (thawing) times for symmetrically cooled (heated) slabs with meat-like thermal properties. MIMM, which is reviewed briefly is not restricted to the usual idealizations such as zero surface resistance, uniform critical temperature distribution, and infinitely large sample. Dimensional analysis is used to identify the dimensionless groups controlling freezing and thawing front propagation in slabs, cylinders, and spheres having uniform thermal properties and constant freezing temperature. The MIMM results provide a basis for evaluating the qualitative origins and the quantitative extent of the success of Plank's (1913) old model. The freezing times predicted by the moving front model used here agree with those predicted by the empirical correlation found by Cleland and Earle for the Karlsruhe test substance. AA

- 507 FAVETTO (G), CHIRIFE (J) and BARTHOLOMAI (GB). A study of water activity lowering in meat during immersion-cooking in sodium chloride-glycerol solutions. I. Equilibrium considerations and diffusional analysis of solute uptake. J. Food Technol. 16(6); 1981; 609-19

Beef slices were dehydrated by immersion-cooking in a sodium chloride glycerol solution of lower water activity (0.74) in the range of temperatures 30 to 85 C. Equilibrium studies of sodium chloride-glycerol concentration in beef and the external solution were conducted. Results showed that the equilibrium condition between beef and external solution is given by the equality of sodium chloride and glycerol concentration in the water of the solution and in the muscle tissue water. The variation of water content, sodium chloride and glycerol content in beef has been determined as a function of immersion time. Solute uptake data by beef slabs were handled according to standard techniques used for obtaining diffusion coefficients assuming unsteady state Fickian diffusion. AA

- 508 BJARNO (O-C). Multicomponent analysis of meat products. J. Assoc. Off. Anal. Chem. 64(6); 1981; 1392-6

A new method for rapid multicomponent analysis of meat products is reported. The sample is homogenized, and then dispersed by treatment

with an alkaline aqueous solution combined with mechanical subdivision. Constituents are determined by infrared transmission spectrophotometry in the fundamental IR absorption bands. It is possible to measure protein, fat, and carbohydrate in about 5 minutes with an accuracy and precision comparable to that of well established standard methods, and no expensive or dangerous chemicals are used. AA

- 509 FOX (JB), ZELL (TE) and WASSERMAN (AE). Interaction between sample preparation techniques and colorimetric reagents in nitrite analysis in meat.

J. Assoc. Off. Anal. Chem. 64(6); 1981; 1397-402

The amount of nitrite measured in model and meat systems was a function of the interactions of the chloride and ascorbate concentrations with the method of sample preparation and the combination of Griess reagents used for colorimetric determination. Ascorbate caused loss of nitrite in the samples when heated and interfered in the Griess reaction, increasing the concentration of pigment formed from any given concentration of nitrite if sulfanilic acid and N-(1-naphthyl)-ethylenediamine were used, and decreasing the amount if sulfanilamide and 1-naphthylamine were used. The interference was eliminated by both the AOAC procedure and mercuric chloride addition, although the former was less effective at higher ascorbate concentrations. Chloride increased the amount of pigment formed from a given amount of nitrite with sulfanilic acid, but had no effect on the amount of sulfanilamide pigment. AA

- 510 LEE (M), CASSENS (RG) and FENNEMA (OR). Effect of metal ions on residual nitrite.

J. Food Process. Preserv. 5(4); 1981; 191-205

The effect of various metal ions on residual nitrite was studied in both a meat system and a model system. Reducing ability, nitrosylheme-chrome, nitrate and pH were determined in an attempt to explain the mechanism of loss of nitrite in the system. The control meat system contained 2% NaCl and 156 ppm of NaNO_2 while treatment groups had 0.05% of metal ions (Fe^{++} , Fe^{+++} , Cu^{++} , Zn^{++} , Ca^{++} , and Mg^{++} as chloride salts) substituted for the same amount of NaCl. The results showed that ferrous (Fe^{++}), ferric (Fe^{+++}), cupric (Cu^{++}) and zinc (Zn^{++}) ions caused a depletion of nitrite while calcium (Ca^{++}) and magnesium (Mg^{++}) ions did not have any effect on residual nitrite. The model system consisted of 25mM PIPES buffer at pH 5.8 to which was added 156 ppm NaNO_2 with or without 0.05% metal ions. Only ferrous (Fe^{++}) ion decomposed more nitrite than the control after heating. Considering the results from both systems, the mode of action for each ion appeared to be different; ferrous ion appeared to act directly as an electron donor, ferric ion acted like ferrous after being reduced, cupric ion appeared to act as an electron donor after being reduced and then as an electron acceptor, and zinc ion seemed to be effective only by decreasing the pH of the system. AA

- 511 SAMEJIMA (K), ISHIOROSHI (M) and YASUI (T). Relative roles of the head and tail portions of the molecule in heat-induced gelation of myosin.

J. Food Sci. 46(5); 1981; 1412-8

- 512 WINGER (RJ) and POPE (CG). Selection and training of panelists for sensory evaluation of meat flavours.

J. Food Technol. 16(6); 1981; 661-9

Despite the necessity to select panelists sensitive to flavour changes and rigorously train them for meat quality evaluations, there is no published methodology to achieve this aim. Meat off-flavours, notably rancidity, are extremely complex. General methods already described for sensory evaluation of foods are inadequate to establish rigorous yet practical procedures for use in studies on meat quality. This paper summarizes the experiences and details the procedures developed for training panelists in the rancid flavour assessment of lamb. AA

- 513 FIELD (RA) and ARASU (P). A simple method for estimating amount of red marrow present in mechanically deboned meat.

J. Food Sci. 46(5); 1981; 1622-3

Muscle:red marrow mixtures containing 0,10,20,30,40, and 50% marrow (w/w) were prepared to simulate the widest range of red marrow percentages which might be found in mechanically deboned meat (MDM). Significant increases in pH with each increase in marrow concentration and a correlation coefficient of 0.96 between marrow concentration and pH were found. Therefore, pH values can be used to estimate red marrow concentration in MDM, once average values for pH of meat attached to bones and marrow in those bones are established at individual deboning operations. Level of red marrow in MDM is related to functional properties such as water holding capacity as well as nutritional value and palatability. AA

- 514 HICKS (CL), KEMP (JD), HOLBROOK (J) and PATTERSON (K). Corn sweeteners in ham formulas.

J. Food Sci. 46(5); 1981; 1626, 1628

Corn sweeteners were compared with sucrose in cure formulas for hams. Thirty-six hams were randomly treated with nine sweetener treatments replicated four times. Combinations of sucrose, 55% high fructose corn syrup, 42% high fructose corn syrup, and high maltose corn syrup were used in brine formulas for pumping the hams. Sensory evaluations found no significant difference between sweetener type and sensory scores on colour, flavour, tenderness, and overall satisfaction. However, ham weights appeared to be affected slightly by sweetener type. Sucrose produced greater ham yields at a 3% sweetener level. However, 55% high fructose corn syrup at 3.15% equalled the yield observed for sucrose. Forty-two percent high fructose corn syrup at greater than 3.3% solid level approached the yields observed for sucrose. Since sensory factors do not appear to be affected by corn syrup solids, only economic and yield factors need be considered for their use in commercially produced hams. AA

- 515 O'BRIEN (JJ), CAMPBELL (N) and CONAGHAN (T). Effect of cooking and cold storage on biologically active antibiotic residues in meat.

J. Hyg. 87(3); 1981; 511-23

An investigation was undertaken to see if cooking or cold storage would destroy or decrease the level of biologically active antibiotic in tissues from animals given therapeutic doses of antibiotic on three occasions prior to slaughter. The effects of cooking and cold storage on the biological activity of the residues of ampicillin, chloramphenicol, oxytetracycline, streptomycin and sulphadimidine were varied; in some instances the effects were minimal, in others nil. AA

BEEF

- 516 TONG (AKW), NEWMAN (JA), MARTIN (AH) and FREDEEN (HT). Live animal ultrasonic measurements of subcutaneous fat thickness as predictors of beef carcass composition.

Can. J. Anim. Sci. 61(2); 1981; 483-91

- 517 BAGHE-KHANDAN (MS) and OKOS (MR). Effect of cooking on the thermal conductivity of whole and ground lean beef.

J. Food Sci. 46(5); 1981; 1302-5

- 518 HUTTON (CW), NEGGERS (YH) and LOVE (TO). Scanning electron microscopy, proteolytic enzyme activity, and acceptability of beef semitendinosus cooked by microwaves and conventional heat.

J. Food Sci. 46(5); 1981; 1309-14, 1319

- 519 NOFAL (MA). Effect of textured soy flour level on the acceptance of ground beef in Egypt.

J. Food Sci. 46(5); 1981; 1630-31

- 520 NEWBOLD (RP) and TUME (RK). Comparison of the effects of added orthophosphate on calcium uptake and release by bovine and rabbit muscle sarcoplasmic reticulum. *J. Food Sci.* 46(5); 1981; 1327-32
- 521 FAVETTO (G), CHIRIFE (J) and BARTHOLOMAI (GB). A study of water activity lowering in meat during immersion-cooking in sodium chloride-glycerol solutions. II. Kinetics of a_w lowering and effect of some process variables. *J. Food Technol.* 16(6); 1981; 621-8
 Beef slabs were dehydrated by immersion-cooking in a sodium chloride glycerol solution of lower water activity (a_w) in the range of temperatures 30 to 85 C. The present work studies the kinetics of a_w lowering in beef as a function of various processing variables (solution temperature, sample thickness) as well as the effect of various pretreatments applied to the beef. AA
- 522 DAHL (CA), MATTHEWS (ME) and MARTH (EH). Fate of *Staphylococcus aureus* in beef loaf, potatoes and frozen and canned green beans after microwave heating in a simulated cook/chill hospital food service system. *J. Food Prot.* 43(12); 1980; 916-23, 932
 Beef loaf was initially cooked to a mean end temperature (ET) of 66 C, potatoes were rehydrated and heated to a mean ET of 79 C and beans were not cooked initially. Products were covered and stored for 24 hours at 6 C. Products were portioned, 100 g/portions, stored for 2 hours at 6 C and microwave heated. Number of *S. aureus* in products decreased as time of microwave heating increased. When the mean ET of samples was approximately 74.77 C. Hazard Analysis Critical Control Point (HACCP) model microwave heating did not consistently result in lethality of *S. aureus*. VR

PORK

- 523 MARTIN (AH), FREDEEN (HT), LHIRONDELLE (PJ), MURRAY (AC) and WEISS (GM). Pork quality attributes: Their estimation and their relationships with carcass composition in commercial pigs. *Can. J. Anim. Sci.* 61(2); 1981; 289-98
 A survey of certain muscle parameters was conducted on 3114 swine carcasses at three major Canadian commercial packing plants and from a wide range in carcass fatness (backfat measurements) and carcass weights. Sex of carcass had no significant effect on pork quality measurements. There were large regional differences in the incidence of pale, soft, exudative (PSE) and dark, firm, dry (DFD) musculature and these may have resulted from differences in method of stunning (CO₂ vs. electrical) or from differences in preslaughter stress and other management conditions associated with plant of origin. Muscle quality attributes were not associated with grade (i.e. backfat and weight) and multiple regression equations based on several measures of carcass composition explained less than 11% of the variance observed in any of the quality attributes. The frequency of moderate to severely watery longissimus dorsi muscle (PSE score < 2.0) ranged from 2.5 to 9.7% depending on plant of origin, with plant differences in the frequency of DFD musculature (scores > 3.5) ranging from 21.5 to 34.9%. Muscle temperature and pH taken 45 minutes post-mortem, the measures conventionally employed for early detection of potentially PSE pork, were of negligible utility for this purpose. AA
- 524 FURTADO (RM), PEARSON (AM), GRAY (JI), HOGBERG (MG) and MILLER (ER). Effects of cooking and/or processing upon levels of aflatoxins in meat from pigs fed a contaminated diet. *J. Food Sci.* 46(5); 1981; 1306-8, 1319
 Pork loins, bellies and hams from pigs fed a diet containing 571 and 386 µg of aflatoxins B₁ and B₂ per kg of feed, respectively, for 42 days were analyzed for aflatoxins in the fresh, fresh-cooked, cured smoked (hams only) and cured-smoked-cooked states. Although some destruction of

aflatoxins B₁ and B₂ occurred during cooking and/or processing, the maximum amount of inactivation did not exceed 41% of the total, and was generally in the range of 15-30%. Thus, results suggest that aflatoxins are quite stable during cooking and/or processing. AA

- 525 LEWIS (PK) Jr., RAKES (LY), BROWN (CJ) and HECK (MC). Interaction between ante-mortem stress, sampling time and pH found in certain pork muscle characteristics.
J. Food Sci. 46(5); 1981; 1315-9

- 526 VAUGHN (MW), WALLACE (DP) and FORSTER (BD). Yield and comparison of nutritive and energy values: Pigs' feet, Pigs' tails.
J. Food Sci. 46(5); 1981; 1320-22, 1344

- 527 HUFFMAN (DL), LY (AM) and CORDRAY (JC). Effect of salt concentration on quality of restructured pork chops.
J. Food Sci. 46(5); 1981; 1563-5

- 528 MOTYCKA (RR), DIPPEL (JA) and SCHMIDT (GR). Influence of tumbling on pickle incorporation, yield and quality of bacon.
J. Food Sci. 46(5); 1981; 1566-8, 1585

The influence of tumbling on pickle incorporation, yield and quality of bacon was evaluated. Pork bellies (300) were assigned to five processing treatment groups: multineedle injection, multineedle injection then vacuum tumble, vacuum tumble plus free pickle, vacuum tumble (with injection needles exposed) plus free pickle, and vacuum tumble while pickle injecting. Although treatment differences existed for pickle incorporation and yield, no treatment was consistently superior for pickle incorporation, yield, and quality. Nitrosopyrrolidine levels in samples from all treatments were acceptable according to USDA standards. A positive correlation existed between carcass backfat thickness and pickle incorporation in bellies multineedle injected, but negatively correlated when tumbled. Carcass backfat thickness and hot carcass weight were positively correlated to final bacon yield regardless of treatment. AA

- 529 ROBACH (MC) and ADAM (K). Preliminary observations on human reactions related to sensory evaluation of cooked commercial bacon.
J. Food Prot. 43(12); 1980; 933-5, 938

Two groups of 10 panelists each taste tested 30 strips of baked, commercial bacon. One group was informed that in a previous study mild irritant reactions had occurred. The other group was not informed of any previous irritant reactions. Telephone interviews the day following the taste test revealed that none of the non-informed panelists experienced any irritant reactions. Five of the 10 informed panelists reported mild irritant reactions related to taste testing the bacon. AA

- 530 MARTIN (AH), FREDEEN (HT), WEISS (GM), FORTIN (A) and SIM (D). Yield of trimmed pork product in relation to weight and backfat thickness of the carcass.
Can. J. Anim. Sci. 61(2); 1981; 299-310

Yield of commercially trimmed (CT), boned (B) and boned-defatted (BDF) pork in relation to weight and backfat thickness was evaluated from a sample of 3807 carcasses obtained from the kill lines of three commercial packaging plants located in the provinces of Alberta, Ontario and Quebec. Sampling procedures at each plant were designed to provide carcasses from 10 males and 10 females in each cell of a grid defined by 10 weight classes (5-kg intervals ranging from 60 to 100 kg) and 13 fat classes (5-mm intervals ranging from 35 to 90 mm). Fat classes were determined on the basis of the sum of two measurements made at the points of minimum back and maximum loin. Fat class was the primary determinant of yield from the individual lean cuts (ham, loin, picnic and butt) with yield of CT, B and BDF product decreasing as fat class increased. Carcass weight had a negligible influence on yield after fat was considered and the effect associated with region and sex, while statistically significant, were also negligible. These results indicated that a single

regression equation based on fat class would suffice for purposes of yield grading of Canadian hog carcasses. This equation identified a change in percentage yield of the combined lean cuts of 0.89% per fat class (5 mm of fat), with this relationship stable over the carcass weight range of 55-105 kg. Percentage yield of CT product from the total carcass (lean cuts plus belly) was less responsible to changes in total fat (0.50%) because belly yield, both untrimmed and trimmed, increased with increasing fatness. AA

- 531 GALTIER (P), ALVINERIE (M) and CHARPENTEAU (JL). The pharmacokinetic effects of ochratoxin A in pigs, rabbits, and chickens. Food Cosmet. Toxicol. 19(6); 1981; 735-8

Ochratoxin A persists in the body of the pig. The large apparent volumes of distribution calculated for the rabbit and chicken indicated a wide distribution of the toxin in these organisms. Physiological processes such as serum albumin binding, digestive flow rate, or biotransformation pathways are suggested as explanations for the observed species differences in the pharmacokinetics of ochratoxin A. KMD

- 532 NEFF (GL) and EDDS (GT). Aflatoxins B₁ and M₁ : Tissue residues and feed withdrawal profiles in young growing pigs. Food Cosmet. Toxicol. 19(6); 1981; 739-42

Distribution and clearance profiles of aflatoxin B₁ (AFB₁) and its metabolite aflatoxin M₁ (AFM₁) were investigated in young growing pigs given AFB₁ orally for 3 weeks and then killed after varying withdrawal periods. Levels of 34, 341, 866 and 1253 ng AFB₁/g diet were fed and two pigs were killed from each group at 0, 1, 2 and 4 days after the experimental rations were withdrawn. Liver, kidney and muscle tissues were collected for analysis. The highest concentrations of the toxin were found in the kidney, as the AFM₁ metabolite. At zero withdrawal time, AFB₁ and AFM₁ were present in the liver and kidney of the groups fed 866 or 1253 ng/g. One of the pigs fed the 1253-ng/g diet retained AFM₁ residues in the kidney 2 days after withdrawal of the test diet. No AFB₁ residues were detected in any tissues 1 day after withdrawal. No residues were detected in any tissues 4 days after withdrawal or in the muscle tissues examined at any time. AA

HOG

- 533 FREDEEN (HT) and WEISS (GM). Comparison of techniques for evaluating lean content of hog carcasses. Can. J. Anim. Sci. 61(2); 1981; 319-33

SWINE

- 534 KENNELLY (JJ), AHERNE (FX) and SAUER (WC). Volatile fatty acid production in the hindgut of swine. Can. J. Anim. Sci. 61(2); 1981; 349-61

HORSE

- 535 ANON. Sale of Horseflesh. Br. Food J. 83(903); 1981; 101, 114
Discusses in brief the law, both present and past related to sale of horseflesh for human consumption. BSN

CHICKEN

- 536 LEE (FV), KHAN (MA) and KLEIN (BP). Effect of preparation and service on the thiamine content of ovenbaked chicken. J. Food Sci. 46(5); 1981; 1560-62

Chicken breast halves were oven-baked and evaluated for thiamine content when prepared and served under a cafeteria-style foodservice system. After preparation, they were held on a steam table for 90 minutes, frozen stored for 4 weeks and finally reheated using conventional and microwave ovens. Thiamine determinations were conducted on raw, cooked, hot-held, frozen-cooked and reheated samples. The mean total percent cooking losses for the freshly cooked chicken were $20.4 \pm 10.9\%$. The steam table holding for 90 minutes resulted in $4.4 \pm 0.7\%$ evaporation losses. The mean percent evaporation losses for the microwave reheated chicken were not significantly different from those of the conventionally reheated samples. No significant differences were noted in the moisture and fat content among various treatments. The thiamine content of raw meat when calculated on a dry, fat-free basis was significantly higher than the thiamine content of the cooked meat. There were no significant differences in the thiamine content after various treatments. AA

- 537 JONAS (DA). Collaborative trial to examine the commercial application of parts of Council Regulation (EEC) No. 2967/76 laying down common standards for the water content of frozen and deep frozen chickens, hens and cocks.

J. Food Technol. 16(6); 1981; 683-92

Under commercial conditions the techniques described in Annexes I and III of Regulation 2967/76 are practicable. However, in interpreting the water/protein relationships of commercially produced poultry, consideration should be paid to the fact that water pick-up during spray washing and mechanical immersion chilling is inversely related to carcass weight. Also since offal contains a higher physiological water content than chicken carcasses and the carcasses are always packed with a random set of washed offal their influence on the water/protein relationship of the carcass and offal combined is greater for smaller carcasses than for larger ones. (In accordance with UK practice throughout this paper, offal means neck, gizzard, liver and heart.). AA

- 538 OLSON (VM), SWAMINATHAN (B) and STADELMAN (WJ). Reduction of numbers of *Salmonella typhimurium* on poultry parts by repeated freeze-thaw treatments.

J. Food Sci. 46(5); 1981; 1323-6

Cells of *Salmonella typhimurium* suspended in 50 ml of 0.1% buffered peptone were subjected to five cycles of rapid or slow freezing and rapid or slow thawing. A five cycle rapid freeze-rapid thaw process was found to be an effective treatment resulting in 99% reduction in the numbers of *S. typhimurium* cells. Of the surviving cells after treatment, 75% was sublethally injured. The five cycle rapid freeze-rapid thaw process was investigated for its effectiveness in reducing numbers of *S. typhimurium* cells on experimentally inoculated chicken wings. The part of chicken wings consisting of ulna and radius with attached skin and muscle was inoculated with low (16-20 CFU/g) or high (ca 1,100 CFU/g) numbers of *S. typhimurium* and each wing was subjected to five cycles of the rapid freeze-rapid thaw process. There was over 90% reduction in the numbers of *S. typhimurium* cells on the chicken wings after the freeze-thaw treatment. AA

- 539 MEHDI (NAQ), CARLTON (WW) and TUIITE (J). Citrinin mycotoxicosis in broiler chickens.

Food Cosmet. Toxicol. 19(6); 1981; 723-33

The single-dose, oral, LD₅₀-value of citrinin in 7-day-old male broiler chicks was found to be 95 mg/kg. Watery diarrhoea and increased water consumption were the most consistent signs of citrinin mycotoxicosis. Histopathological alterations of the kidney, hepatic lesions, and lymphoid necrosis were also observed. When chickens were given 100, 250, or 500 ppm citrinin in the diet for 3 weeks, they showed the clinical signs of citrinin mycotoxicosis, and their kidneys were enlarged; but no histopathological alterations were found. KMD

TURKEY

- 540 BRENNAND (CP) and MENDENHALL (VT). Acceptance and species identification of turkey steaks prepared with beef, pork, lamb, and turkey fat. *J. Food Sci.* 46(5); 1981; 1624-5
Fabricated extruded steaks were prepared from turkey meat, salt, phosphate, and water plus 15% beef, pork, lamb, or turkey fat. The grilled samples received relatively high hedonic scores from a sensory panel. The flavour, juiciness, and overall quality of the samples made with pork, beef, and turkey fat were preferred significantly over the samples made with lamb fat. Panel members tended to consider all samples as being pork flavoured. Beef, pork, or turkey fat could be used as the fat in a fabricated, extruded steak without affecting the relative acceptability of the cooked product. AA
- 541 CHAMBERS (E) and BOWERS (JA). Sensory characteristics of postmortem papain injected turkey cooked conventionally or by microwaves. *J. Food Sci.* 46(5); 1981; 1627-8
Sensory characteristics of papain-injected turkey breast muscle cooked in microwave or conventional ovens were evaluated by a panel. Off-flavour and mealiness developed in intact turkey muscles injected with papain, but those levels of papain were not sufficient to tenderize the muscle. Samples cooked in conventional ovens had greater roast turkey flavour and were less juicy than samples cooked in microwave ovens. AA

EGG

- 542 WOOTTON (M), HONG (NT) and PHAM THI (HL). A study of denaturation of egg white proteins during freezing using differential scanning calorimetry. *J. Food Sci.* 46(5); 1981; 1336-38
Differential Scanning Calorimetry was used to determine the effect of freezing rate, thawing conditions, storage time and storage temperature on the enthalpy of denaturation of frozen egg white. Viscosity, foam specific gravity and foam instability of the product were also determined. Loss of enthalpy of denaturation was increased by slower freezing rates, higher thawing temperatures, higher storage temperatures, and longer storage times. Conalbumin suffered greater losses, and ovalbumin smaller losses, than egg white itself. Changes in egg white viscosity, foam specific gravity and foam instability varied depending on the processing variable tested and had no clear-cut relation with losses in enthalpy of denaturation. AA
- 543 MONSEY (JB) and JONES (JM). Reaction of egg extracts with 3, 3', 5, 5' tetramethyl benzidine. A possible method for evaluating the storage history of chicken shell eggs. *J. Food Technol.* 16(6); 1981; 701-3
- 544 CREMER (ML). Microwave heating of scrambled eggs in a hospital food-service system. *J. Food Sci.* 46(5); 1981; 1573-6, 1581

SEAFOODS

- 545 LAL MOHAN (RS). An illustrated synopsis of the fishes of the family Sciaenidae of India. *Indian J. Fish.* 28(1/2); 1981; 1-24
Sciaenid fishes constitute about 6% of the total marine fish landings of India. This paper contains descriptions of 36 species of sciaenids found in Indian waters, along with a key for identification. Thirty species are illustrated. KMD

- 546 HUSSAIN (SM) and ALI KHAN (J). Fishes of the family Cynoglossidae from Pakistan coast.
Indian J. Fish. 28(1/2); 1981; 128-42
11 species of *Cynoglossids* belonging to two genera, *Paraplagusia* and *Cynoglossus* were collected by commercial fishing trawlers in the waters off the Pakistani coast. *Paraplagusia blochii*, *Paraplagusia bilineata*, and *Cynoglossus borneensis* were recorded for the first time from this region. Detailed descriptions are given of all the 11 species. KMD
- 547 CAREY (R), WHITNEY (LF) and CORREA (LR). Fish orientation and feed rate effects on air separation by shape.
J. Food Sci. 46(5); 1981; 1582-5
A mechanical system has been developed to automatically separate flat fish from round fish by utilizing their differences in projected area and aerodynamic properties. A continuous stream of mixed fish is moved along a belt conveyor at a rapid rate, and upon discharge each fish is subjected to blast of high velocity air. Differences in shape and ratio of projected area to weight of flat fish and round fish are sufficient to alter their trajectories and therefore enable their separation. Experimental results indicate that the system is a practical method to sort fish by shape, either at sea or ashore. AA
- 548 SEGARS (RA), JOHNSON (EA), KAPSALIS (JG) and PELEG (M). Some tensile characteristics of raw fish flesh.
J. Texture Stud. 12(3); 1981; 375-87
- 549 KENT (M) and STROUND (GD). Microwave attenuation of frozen *Nephrops norvegicus*.
J. Food Technol. 16(6); 1981; 647-54
The effects of chilled storage on the microwave attenuation of frozen *Nephrops norvegicus* are studied in relation to changes in various constituents of the flesh. Correlations are sought between attenuation and nitrogen content as well as solids and fat contents. The study is unable to detect regular seasonal variations in these constituents or in microwave attenuation but significant correlations are obtained with changes occurring during chilled storage due to uptake of water. AA
- 550 SHEWFELT (RL), McDONALD (RE) and HULTIN (HO). Effect of phospholipid hydrolysis on lipid oxidation in flounder muscle microsomes.
J. Food Sci. 46(5); 1981; 1297-301
- 551 LIU (LL) and PIGOTT (GM). Preparation and use of inexpensive Crude pepsin for enzyme hydrolysis of fish.
J. Food Sci. 46(5); 1981; 1569-72
A high quality white, fluffy, water-soluble fish protein hydrolysate (PFH) powder can be prepared by pepsin hydrolysis of fish flesh. However, the use of this process is limited by the high cost of pepsin which must be purchased as pharmaceutical grade. A practical method was developed for producing crude pepsin preparations of sufficient purity to allow efficient operation of the FPH process. Samples of crude enzymes prepared by autodigestion of hog stomach mucosa, especially at pH 1.0, gave high pepsin activity. A detailed procedure is presented for preparing this high activity, low cost crude pepsin for the FPH process. AA
- 552 REVANKER (GD) and BALIGA (BL). Ready-to-heat and serve frozen fish curry.
Indian Food Packer. 36(1); 1982; 54-61
Data on material balance, preparation of gravy, mode of packing, ratio of gravy to fish, man hours required for dressing, method of serving the frozen fish product and consumer acceptance studies on ready-to-heat and serve frozen fish curry have been covered. BSN

- 553 ITO (Y), TONOGAI (Y), SUZUKI (H), OGAWA (S), YOKOYAMA (T), HASHIZUME (T), SANTO (H), TANAKA (K-I), NISHIGAKI (K) and IWAIDA (M). Improved 4-aminoantipyrine colorimetry for detection of residual hydrogen peroxide in noodles, fish paste, dried fish and herring roe. J. Assoc. Off. Anal. Chem. 64(6); 1981; 1448-52

RAY-FISH

- 554 KUNJI PALU (KK) and BOOPENDRANATH (MR). Note on the catch of a giant ray *Manta birostris* (Walbaum) off Veraval, North West Coast of India. Indian J. Fish. 28(1/2); 1981; 278-80
A giant Devil ray, *Manta birostris* (Walbaum) caught off Veraval has been described. The specimen measured 6800 mm (22 ft) across the disc and weighed 2 ton. The specimen is the largest ray so far reported from Indian waters. KMD

BREAM

- 555 MADAN MOHAN and GOPAKUMAR (G). On the occurrence of *Nemipterus metopias* (Bleeker 1952) (Nemipteridae, Pisces) from the South-West coast of India. Indian J. Fish. 28(1/2); 1981; 280-82
Five specimens of *Nemipterus metopias*, from 221 to 256 mm in total length, were reported for the first time from hook-and-line catches at Vizhinjam (lat. 8° 21', 30 N, long. 76° 56', 15 E) in Kerala. Five other species of *Nemipterus* are already known to occur off the Indian coast. A description of the new species has been given. KMD
- 556 INDRA (TJ). A note on the occurrence of *Nemipterus metopias* (Bleeker) from Madras coast. Indian J. Fish. 28(1/2); 1981; 290-91
5 species of *Nemipterus* (thread-fin breams or monocle breams) are already known to occur off the Madras coast. A sixth species, *Nemipterus metopias*, has recently been found in this area and has been described. KMD

RED HAKE

- 557 LANDOLT (LA) and HULTIN (HO). The removal of trimethylamine oxide and soluble protein from intact red hake muscle by washing. J. Food Process. Preserv. 5(4); 1981; 227-42
Soaking red hake fillets in water (1:20) removes significant amounts of TMAO and water-soluble proteins from the exterior but not interior muscle layers. Scoring the muscle before soaking allowed these components to be removed from the muscle interior. The water uptake which occurred on soaking was increased after scoring. Changing the pH of the soak water had no effect on TMAO or protein removal, but there was inhibition of water uptake at pH 4.0. The addition of NaCl to the extracting solution did not affect TMAO removal, but decreased both soluble protein loss and water uptake. The size and shape of the red hake fillets did not materially affect loss of TMAO or soluble protein, but water uptake was related to the surface area to volume ratio. A short-term wash or spray treatment also reduced TMAO and soluble protein contents in the exterior layers of the fillet. AA

WHITING

- 558 HAMILTON (M) and BENNETT (R). A comparative study of consumer preference for blue whiting (*Micromesistius poutassou*) and whiting (*Merlangius merlangus*) before and after incorporation into products. J. Food Technol. 16(6); 1981; 655-9

Good quality blue whiting and whiting fillets were compared by taste panels before and after incorporation into five products. In the plain cooked form, blue whiting was liked by assessors but whiting was preferred marginally. In product form, both fish were well liked and there was no significant preference for either species. AA

MACKEREL

- 559 LEU (S-S), JHAVERI (SN), KARAKOLTSIDIS (PA), CONSTANTINIDES (SM)
Atlantic mackerel (*Scomber scombrus* L.) : Seasonal variation in proximate composition and distribution of chemical nutrients.
J. Food Sci. 46(5); 1981; 1635-8

BLOWFISH

- 560 TOYODA (M), KINGKATE (H), JAENGSAWANG (C), THANISSORN (W) and HALILAMIAN (C). Survey of ciguatera and tetrodotoxin of blowfish in Thailand.
J. Food Safety. 3(4); 1981; 207-13

SILVER BELLIES

- 561 ANNAM (VP) and DHARMA RAJA (SK). Trends in the catch of silverbellies by mechanized boats in Tamil Nadu during 1971-75.
Indian J. Fish. 28(1/2); 1981; 87-95

The annual average catch of silverbellies (*Leiognathus dussumieri* (Valencieness)) amounts to about 3% of the total marine fish catch in India. Catches by mechanized boats from the E. coast ports of Royapuram (Kasimedu), Cuddalore, Portonovo, Adirampatnam, Mandapam, and Rameswaram during the period 1971-75 have been reported. An attempt has been made to establish a correlation between the index of abundance and the total fishing effort. KMD

PRAWN

- 562 SHUKLA (GS) and MURTI (R) and OMKAR. New record of two species of freshwater prawns (*Macrobrachium*) from Gorakhpur region.
Indian J. Fish. 28(1/2); 1981; 287-9

Two species of freshwater prawn, *Macrobrachium naso* (Kemp) and *M. dayanum* (Henderson) are reported for the first time from the Gorakhpur region of Uttar Pradesh, India. The morphological differences observed in the shape of the rostrum, number of rostral teeth, and in the second peraeopod are briefly discussed. KMD

- 563 THOMAS (MM). Preliminary results of electrophoretic studies on marine prawns.
Indian J. Fish. 28(1/2); 1981; 292-4

Proteins from the abdominal muscle tissue of four species of penaeid prawns were separated by electrophoresis on polyacrylamide gel. The number of bands varied as follows: 7 for *Metapenaeus monoceros*, 8 for *M. dobsoni*, 11 for *M. affinis*, and 13 for *Penaeus indicus*. KMD

- 564 NIP (WK) and MOY (JH). Effect of thawing and subsequent chilling on the quality of prawn, *Macrobrachium rosenbergii*.
J. Food Process. Preserv. 5(4); 1981; 207-13

A study was made on the shelf life of thawed, freshwater prawns. Prawns frozen by various methods were held frozen for 1 month at -18 C, then thawed and held under ice-chilled condition up to 48 hours. Their physical, chemical, microbiological and sensory attributes were examined. Results showed that ice-chilling up to 48 hours immediately after thawing induced some changes on the peak force/plateau force ratios of the textural profiles, soluble/insoluble collagen ratio and microbial counts.

However, no significant differences were observed between the fresh and the treated prawns on texture. Flavour and acceptance suggesting that quality of prawns held under ice-chilled condition up to 48 hours after thawing was comparable to the fresh ones. AA

SHRIMP

- 565 WILLIAMS (SK), MARTIN (R), BROWN (WL) and BACUS (JN). Moisture migration in frozen, raw breaded shrimp during nine months storage. J. Food Sci. 46(5); 1981; 1577-81

PROTEIN FOODS

NIL

FRUIT JUICES AND BEVERAGES

- 566 ALVAREZ-NAZARIO (F). Westphal plummet determination of alcohol in distillates. J. Assoc. Off. Anal. Chem. 64(6); 1981; 1420-23
A new table gives the percent alcohol by volume in distillates from density values obtained at room temperature by using a Westphal plummet. AA
- 567 KOVAR (J). Oscillating U-tube density meter determination of alcoholic strength: Analysis of parameter errors. J. Assoc. Off. Anal. Chem. 64(6); 1981; 1424-30
Determination of density by using the density meter was superior to pycnometry and hydrometry in precision, accuracy, insensitivity to operator, temperature control, speed, and adaptability to automation. The linearity between oscillation period and density in the range of ethanol-water solutions is more than adequate. The method is practically insensitive to changes in air pressure; the single most important influence on the error in results is temperature reading errors. It is recommended that the Organisation Internationale de Metrologie Legale General Formula be used to correlate densities with alcoholic strength. AA
- 568 JONES (RP), PAMMENT (N) and GREENFIELD (PF). Alcohol fermentation by yeasts: The effect of environmental and other variables. Process. Biochem. 16(3); 1981; 42-9
- 569 BANKS (W), MUIR (DD) and WILSON (AG). Extension of the shelf life of cream-based liqueurs at high ambient temperatures. J. Food Technol. 16(6); 1981; 587-95
The effect of pH adjustment, calcium removal and citrate addition on the stability of a cream liqueur at 45 C was investigated. Evidence is presented to show that by either removal or sequestration of ionic calcium the shelf life of cream liqueurs can be usefully extended. Data is included on the relation between viscosity and composition for a range of liqueurs. AA
- ORANGE JUICE
- 570 GRAUMLICH (TR). Survival and recovery of thermally stressed yeast in orange juice. J. Food Sci. 46(5); 1981; 1410-11
Injury and survival of thermally stressed yeast in orange juice were assessed by plating on plate count agar, acidified potato dextrose agar, and orange serum agar. Thermally stressed yeast were found to have

reduced plate counts on both orange serum agar and acidified potato dextrose agar in comparison to plate count agar. Severely injured populations were not able to repair injury in orange juice held at 25 C, but survived storage at 25, 6, and -18 C. AA

PHALSA JUICE

- 571 KHURDIYA (DS) and ANAND (JC). The colour stability in Phalsa juice. Indian Food Packer. 36(1); 1982; 44-9

During studies on colour stability in Phalsa (*Grewia subinaequalis*) juice, adjustment to different pH values were found of no avail. Hydroxy methyl furfural (HMF) formation in the juice increased with lowering of pH, increasing time and temperature of storage. Addition of cane sugar to the juice was found to have a protective influence on the colour stability. Formation of HMF decreases with increase in the sugar concentration in the juice at 37 C. Light did not have much effect on pigment stability in the juice. Loss of pigment in the juice increased with increase in temperature of processing. The presence of Al and Pb salts had a protective effect on the colour stability in the juice, while Fe and Cu affected it adversely. BSN

APPLE JUICE

- 572 GRAMPP (EG). The production of apple-juice concentrate. Immediate clarification or intermediate storage? Process Biochem. 16(3); 1981; 24-7, 32-4

Discusses: production of apple juice concentrate; and treatment of whole concentrate in turbid state. BSN

COFFEE

- 573 MATHIALAGAN (N), RAMESH (N), JEEVARATHINAM (K), NAGINI (S), RAJANI (M), CHITRA (S) and RAMAKRISHNAN (S). Effect of coffee drinking on lipid profile of human volunteers and rats. J. Coffee Res. 12(3); 1982; 61-7

In vegetarian, non-smoking adult males, consumption of coffee with milk and sugar as in India, even up to 6 cups a day, did not elevate total cholesterol, triacylglycerols and lipoproteins. High density lipoprotein-cholesterol remained unaffected. The ratio of HDL-cholesterol to total cholesterol in the coffee-drinking group was also normal. In albino rats there was actually a decrease of serum triacylglycerols with no change in cholesterol. The present study revealed that drinking coffee with milk and sugar in Indian style up to 6 cups may not be a risk factor to coronary heart diseases. AA

WINE

- 574 PADSHETTY (NS), PATIL (RB), SUBBA RAO (MS) and AMLA (BL). Maturity stage and harvest season effect on dry wine, variety, Bangalore blue (*Vitis vinifera* X *V. labrusca*). Indian Food Packer. 36(1); 1982; 81-4

Grapes were harvested at 3 stages of maturity (before, at and after the commercial maturity stage) in cold (Aug.-Sept. 1976) and hot (March/April 1977) seasons and used for wine fermentation. The volatile constituents of wine samples indicated that grapes harvested at post-mature stage followed by mature stage were found to be better for production of quality wines. Similarly, wines prepared from the grapes of hot season were better in quality than those harvested during cold season. Wines fermented with yeast strain 101 and at a temperature of 15 C contained higher amount of ethyl alcohol. Considerable changes in the volatile constituents were observed in stored wines of post-fermentation period and these changes brought about considerable improvement in the quality of wine. BSN

BEER

- 575 STEWART (GG). Biotechnology in the 1980s. Brew. Dig. 56(8); 1981; 38-41;
- 576 MATHEWSON (PR) and POMERANZ (Y). Rapid analysis of α -amylase in barley malts using a colorimetric assay. Brew. Dig. 56(10); 1981; 24-6
 The colorimetric α -amylase assay can be used to determine the α -amylase activity of a barley malt. The colorimetric analysis of α -amylase activity in malt extract can be done within five minutes, with accuracy and precision equal to or better than the ASBC procedure used today, without the investment in reagents, time and technical experience required by that method. AA
- 577 PIXTON (SW) and HENDERSON (S). The moisture content: Equilibrium relative humidity relationship of malt. J. Stored Prod. Res. 17(4); 1981; 191-5
 The equilibrium relative humidity for samples of green malt removed from the kiln during drying at up to 70 C, was higher than that for samples dried in the laboratory at 35 C, the difference being attributed to these drying temperatures. The relationship between moisture content and equilibrium relative humidity of finished malt removed from the kiln after drying and damped up in the laboratory, was also determined. The equilibrium curve for finished malt was closer to the desorption curve obtained by drying in the kiln than to the curve obtained by laboratory drying. AA
- 578 ANDRZEJEWSKI (D), HAVERY (DC) and FAZIO (T). Determination and confirmation of N-nitrosodimethylamine in beer. J. Assoc. Off. Anal. Chem. 64(6); 1981; 1457-61
 A qualitative method has been developed for the confirmation of N-nitrosodimethylamine (NDMA) in beer by capillary gas chromatography-mass spectrometry (GC/MS) from full mass scans after quantitation, using a gas chromatograph interfaced to a thermal energy analyzer (GC/TEA). The GC/MS method has a lower limit of confirmation of 5 ppb. In a survey of 22 imported and 42 domestic beers, NDMA was found in 60 samples by GC/TEA at levels up to 7.7 ppb, and was confirmed by GC/MS in 5 samples. AA
- 579 PYLER (RE). Spectrophotometric assay of wort protein. Brew. Dig. 56(9); 1981; 20-25

OILS AND FATS

- 580 HUNG (SSO) and SLINGER (SJ). Studies of chemical methods for assessing oxidative quality and storage stability of feeding oils. J. Am. Oil Chem. Soc. 58(7); 1981; 785-8
 Peroxide value (PV), thiobarbituric acid number (TBA), anisidine value (AV), percent free fatty acids (FFA), and carbonyl value (CV) methods were compared in different experiments for their sensitivity and practicality in assessing the oxidative quality of four feeding oils; salmon oil, soyabean oil, canola oil (oil from low erucic acid, low glucosinolate rapeseed), and canola soap stocks. In the first experiment, among the four methods (PV, AV, TBA and FFA) studied, PV appeared to be the most practical for its sensitivity, simplicity, and economy when the four oils were oxidized by bubbling air through at room temperature for 792 hours. In the second experiment, using herring oil, all four methods tested (PV, AV, TBA and FFA) were sufficiently sensitive once the oxidation of herring oil had passed the induction period and the oil was highly oxidized. In the third experiment, of the four methods (PV, AV, TBA and CV) compared, AV was the most sensitive for

measuring the oxidative quality of canola oil aerated at 100 C for 240 hours. Results of further studies suggested that herring and canola oils stored under commercial conditions were stable for at least one year. AA

- 581 LIN (FS), WARNER (CR) and FAZIO (T). Alteration of phenolic antioxidants in heated vegetable oil.

J. Am. Oil Chem. Soc. 58(7); 1981; 789-92

Studies were conducted to follow the fate of antioxidants in heated vegetable oil at temperatures approximating those of frying conditions. Samples of vegetable oils spiked with 0.02% (^{14}C) BHA or 0.02% (^{14}C) TBHQ were heated at ca. 180-190 C for 4.5 hours. It was found that 24 and 48% of the radioactivity added as BHA and TBHQ, respectively, remained in the oils. Normal-phase HPLC analyses revealed that 55% of the radiolabel in the heated BHA-oil and 35% in the heated TBHQ-oil were not eluted as parent substances. The as yet unidentified alteration products in the heated oil appear to be less polar than the added antioxidants. AA

- 582 FARAG (RS), YOUSSEF (AM), KHALIL (FA) and TAHA (RA). The lipids of various fungi grown on an artificial medium.

J. Am. Oil Chem. Soc. 58(7); 1981; 765-8

- 583 Van BOEKEL (MAJS). Estimation of solid-liquid ratios in bulk fats and emulsion by pulsed nuclear magnetic resonance.

J. Am. Oil Chem. Soc. 58(7); 1981; 768-72

- 584 KAKUDA (Y), STANLEY (DW) and Van de VOORT (FR). Determination of TBA number by high performance liquid chromatography.

J. Am. Oil Chem. Soc. 58(7); 1981; 773-5

- 585 MILLS (BL) and Van de VOORT (FR). Comparison of the direct and indirect wide-line nuclear magnetic resonance methods for determining solid fat content.

J. Am. Oil Chem. Soc. 58(7); 1981; 776-8

- 586 WALTKING (AE) and WESSELS (H). Chromatographic separation of polar and nonpolar components of frying fats.

J. Assoc. Off. Anal. Chem. 64(6); 1981; 1329-30

- 587 SENGUPTA (P), CHATTERJEA (JN) and ROY (BR). Studies on methods for the detection of hydrocyanic acid in edible oils.

J. Inst. Chem. (India) 54(II); 1982; 89-91

An extremely sensitive test for detection of cyanide in edible oils has been developed. 50 ml of the sample, 50 ml of water, and 12 ml of 10% tartaric acid are distilled and collected in a flask containing 10 ml of 1 M NaOH. 25 ml of the distillate is taken in another flask and neutralized with acetic acid (1:19); An additional 1 ml of acid is added; this is followed by 1 ml of a 1% solution of chloramine T. After mixing, 15 ml of a reagent, consisting of pyridine mixed with 1-phenyl-3-methyl-5-pyrazolone, is mixed in and allowed to stand for 20 minutes for development of a blue colour. The coloured solution is made up to a predetermined volume with water, and its absorbance is measured by a photoelectric colorimeter or spectrophotometer. The recovery is as good as 92-98% and the sensitivity as good as 10 μg cyanide/ml.

- 588 MIN (DB). Correlation of sensory evaluation and instrumental gas chromatographic analysis of edible oils.

J. Food Sci. 46(5); 1981; 1453-6

Soyabean oil, hydrogenated soyabean oil, and corn oil were exposed to light for various periods of time to obtain a wide range of flavour qualities. The flavour qualities of these oils were evaluated by sensory analysis and instrumental gas chromatographic analysis. The results of the correlation coefficients (r) of flavour scores between the sensory evaluation and the instrumental analysis for soyabean oil, hydrogenated

soyabean oil, and corn oil were 0.99, 0.98, and 0.95, respectively. Therefore, the instrumental analysis can be used to determine the flavour qualities of different oils. AA

- 589 VAN PETEGHEM (CH) and DEKEYSER (DA). Systematic identification of antioxidants in lards, shortenings, and vegetable oils by thin layer chromatography.
J. Assoc. Off. Anal. Chem. 64(6); 1981; 1331-5

OLIVE OIL

- 590 BROSIO (E), CONTI (F), Di NOLA (A), SCORANO (O) and BALESTRIERI (F). Simultaneous determination of oil and water content in olive husk by pulsed low resolution nuclear magnetic resonance.
J. Food Technol. 16(6); 1981; 629-36
A pulsed low-resolution NMR method for the oil and water determination in olive husk samples is reported. It is based on the determination of the solid to liquid ratio of the sample and on the detection of the spin-echo decay curve. This method is very fast and can be fully self-contained, as it does not require either to weigh and dry the sample or any correlation curve. It seems suitable for other oil containing samples, such as seeds. The way to simplify and speed up the procedure is also discussed. AA

SPICES AND CONDIMENTS

- 591 LEWIS (YS). Important spices from South-East Asia. Cultivation and technology.
Indian Food Packer. 36(1); 1982; 62-71
Details of climate and soil, propagation and planting, cultural practices and manuring, pests and diseases, varieties, harvesting and curing, pepper oil and oleoresin of pepper, post harvest technology of cardamom; cinnamon and cassia oils and their distinguishing features, and information on ginger, turmeric, capsicum, nutmeg and mace are given. BSN
- 592 AWE (MJ) and SCHRANZ (JL). High pressure liquid chromatographic determination of aflatoxins in spices.
J. Assoc. Off. Anal. Chem. 64(6); 1981; 1377-82
High pressure liquid chromatography with fluorescence detection is used to determine aflatoxin in 5 common spices. A 10 μ m microparticulate silica gel column is used with a dichloromethane-cyclohexane-acetonitrile solvent system to resolve aflatoxins B₁, G₁, B₂, and G₂. The fluorescence detector contained a silica gel-packed flowcell. Samples of black, white, and red pepper, ginger, and nutmeg were extracted according to a previously published method. Recoveries from aflatoxin-free samples of white pepper, ginger, and red pepper spiked with 1-50 μ g aflatoxin/kg ranged from 64 to 92%. AA

PEPPER

- 593 SALDANA (G) and MEYER (R). Effects of added calcium on texture and quality of canned Jalapeno peppers.
J. Food Sci. 46(5); 1981; 1518-20
Jalapeno peppers were canned and treated with calcium chloride, calcium hydroxide, and calcium lactate. Concentrations of 0.2, 0.3, and 0.4% of calcium were used. After 3 months of storage time, the peppers were evaluated for texture, quality, and nutritional composition. Calcium hydroxide was an inadequate firming compound in this experiment because of its neutralizing effect on the acid content and the precipitation found in the can after storage. Calcium chloride at a concentra-

tion of 0.2% was found to be the most desirable firming compound because under the test conditions, it did not impart a bitter taste and because its solubility properties are better than those of calcium lactate. Higher concentrations failed to significantly increase the firmness of peppers. The treatments produced no adverse effects on the flavour or the vitamin and mineral content, with the exception of calcium, in canned jalapeno peppers. AA

PAPRIKA

- 594 PERFETTI (GA), WARNER (CR) and FAZIO (T). High pressure liquid chromatographic determination of ethoxyquin in paprika and chili powder. J. Assoc. Off. Anal. Chem. 64(6); 1981; 1453-6

KOKUM

- 595 KRISHNAMURTHY (N), LEWIS (YS) and RAVINDARANATH (B). Chemical constituents of Kokum fruit rind. J. Food Sci. Technol. (India). 19(3); 1982; 97-100
Kokum (*Garcinia indica*) fruit rind was analyzed for its chemical composition; (-) hydroxycitric acid, cyanidin-3-glucoside and cyanidin-3-sambuboside were present. The Rf values and absorption maxima of anthocyanins and their aglycones are given in tabular form. The total anthocyanic content (calculated as cyanidin-3-sambuboside) has been 2.4% and in view of the high pigment content, it could be a good source of water soluble red colour and fat soluble yellow colour (garcinol) for colouring foods. KAR

SENSORY EVALUATION

- 596 FIGONI (PI) and SHOEMAKER (CF). Characterization of structure breakdown of foods from their flow properties. J. Texture Stud. 12(3); 1981; 287-305
Discusses: viscoelastic and thixotropic time-dependent flow; characterisation of structure breakdown during shear; and steady shear in time-dependent food systems. BSN

FOOD STORAGE

Nil

INFESTATION CONTROL AND PESTICIDES

- 597 ROY (RB) and KVENBERG (JE). Determination of insect infestation in food: A semiautomated colorimetric analysis for uric acid with immobilized uricase. J. Food Sci. 46(5); 1981; 1439-45
A semiautomated differential colorimetric procedure for the determination of uric acid is reported. Samples are treated with hydrochloric acid, incubated at 55-60 C in water bath, and neutralized with sodium hydroxide. Uric acid is extracted with sodium acetate and is determined with phosphotungstic acid as the colour reagent. Uric acid is destroyed with uricase, and the colorimetric analysis is repeated for a blank measurement. The reaction specificity of uricase and its immobilization in a nylon coil contribute to the liability of the method, which permits analysis of 30 samples/hour. Recovery studies and analysis of actual samples show that uric acid can serve as a chemical index of insect infestation in a variety of foods. The sensitivity of the method

is approximately 5 µg uric acid/g of sample and is adequate to ascertain objectionable levels of stored product insect excreta contamination in food product. AA

- 598 RAJENDRAN (S) and MUTHU (M). Post-fumigation productivity of *Sitophilus oryzae* (L). (Coleoptera: Curculionidae) and *Tribolium castaneum* (Herbst) (Coleoptera: Tenebrionidae) exposed to acrylonitrile, adjuvants of acrylonitrile, acrylonitrile-adjuvant mixtures and other modern fumigants.
Bull. Entomol. Res. 71(2); 1981; 163-9
LD50 doses of chloropicrin, ethylene oxide, ethylene dibromide, acrylonitrile plus 8% carbon dioxide, and acrylonitrile plus ethylene dibromide were found to decrease the productivity of adults of *Sitophilus oryzae* (L.) and *Tribolium castaneum* (Hbst.). Acrylonitrile, acrylonitrile plus methyl iodide and phosphine caused a reduction in productivity in *S. oryzae* but not in *T. castaneum*. Carbon dioxide decreased the productivity of *T. castaneum*. Carbon tetrachloride, methylene chloride, methyl bromide, methyl iodide, acrylonitrile plus carbon tetrachloride and acrylonitrile plus methylene chloride had little influence on the productivity. The productivity of *T. castaneum* exposed to trichloroethylene and acrylonitrile plus trichloroethylene was higher than in control batches. After exposure to acrylonitrile, reduced productivity was noted in adults of *Callosobruchus chinensis* (L.) that had been exposed as adults or pupae, and in *T. castaneum* but not *S. oryzae* that had been exposed as pupae. AA
- 599 HOLE (BD). Variation in tolerance of seven species of stored product Coleoptera to methyl bromide and phosphine in strains from twenty-nine countries.
Bull. Entomol. Res. 71(2); 1981; 299-306
- 600 COLE (DB) and COX (PD). Studies on three moth species in a Scottish port silo, with special reference to overwintering *Ephestia kuehniella* (Zeller) (Lepidoptera: Pyralidae).
J. Stored Prod. Res. 17(4); 1981; 163-81
- 601 BREIDSTER (WW), BAUR (FJ) and JACKSON (WB). Bird control problems and concerns.
Cereal Food World. 26(9); 1981; 539-40
- 602 WODAGENEH (A) and MATHEWS (GA). The addition of oil to pesticide sprays. Effect on droplet size.
Trop. Pest Manage. 27(1); 1981; 121-4
- 603 KAO (C). Determination of aluminium phosphide in fumigants.
J. Food Sci. 46(5); 1981; 1632, 1634
- 604 KAN (GYP), MAH (FTS), WADE (NL) and BOTHWELL (ML). Determination of 2,4-D butoxyethanol ether ester and its degradation products 2,4-dichlorophenoxyacetic acid and 2,4-dichlorophenol in sediment.
J. Assoc. Off. Anal. Chem. 64(6); 1981; 1305-8
- 605 WINKLER (VW), PATEL (JR), JANUSZANIS (M) and COLARUSSO (M). Determination of norflurazon residues in mixed crop matrices.
J. Assoc. Off. Anal. Chem. 64(6); 1981; 1309-11
- 606 UDAYA BHASKAR (S) and NANDA KUMAR (NV). Thin layer chromatographic determination of methyl parathion as paraoxon by cholinesterase inhibition.
J. Assoc. Off. Anal. Chem. 64(6); 1981; 1312-4
- 607 BLAND (PD). Gas-liquid chromatographic determination of pirimicarb in formulations.
J. Assoc. Off. Anal. Chem. 64(6); 1981; 1315-8

- 608 HACHE (P), MARQUETTE (R), VOLPE (G) and MALLET (VN). Fast cleanup of difficult substrates for determination of fenitrothion and some derivatives.
J. Assoc. Off. Anal. Chem. 64(6); 1981; 1470-73
A simple method is described for the fast recovery of fenitrothion, an organophosphorus insecticide, from soil, chicken liver, urine, clams, and pine needles. The substrate is homogenized with acetonitrile or methanol, diluted with water, and passed through a column containing Amberlite XAD-7. Fenitrothion is recovered quantitatively by eluting with 4 portions of 25 ml ethyl acetate. After evaporation, the compound is determined quantitatively by gas-liquid chromatography with a flame photometric detector. The procedure is also suitable for some derivatives of fenitrothion, namely, fenitrooxon and S-methyl-fenitrothion. As low as 0.05 ppm of the parent compound may be determined. AA

BIOCHEMISTRY AND NUTRITION

- 609 ANON. Hormones and antibiotics.
Br. Food J. 83(902); 1981; 68-70, 79
Discusses the use, existing controls, dangers and toxicological aspects of hormones and antibiotics used in animal husbandry and food production. BSN
- 610 DIKSHIT (M) and CHITRE (RG). The concept of essential amino acids in human nutrition. Part III. Studies in blood protein amino gram of undernourished adults under stress and strain.
Indian J. Nutr. Dietet. 18(7); 1981; 255-9
- 611 ELLEFSON (WC), RICHTER (E), ADAMS (M) and BAILLIES (NT). Evaluation of ion exchange resins and various enzymes in thiamine analysis.
J. Assoc. Off. Anal. chem. 64(6); 1981; 1336-8
- 612 HALLING (PJ). Protein-stabilized foams and emulsions.
CRC Crit. Rev. Food Sci. Nutr. 15(2); 1981; 155-203
- 613 HECKMAN (MM) and LANE (SA). Comparison of dietary fiber methods for foods.
J. Assoc. Off. Anal. Chem. 64(6); 1981; 1339-43
- 614 MERCURIO (KC) and BEHM (PA). Effects of fiber type and level on mineral excretion, transit time, and intestinal histology.
J. Food Sci. 46(5); 1981; 1462-3, 1477

TOXICOLOGY AND HYGIENE

- 615 LONDON (JF), CLAPP (NK) and HENKE (MA). Effects of dietary bran and the colon carcinogen 1,2-dimethylhydrazine on faecal β -glucuronidase activity in mice.
Food Cosmet. Toxicol. 19(6); 1981; 707-11
The results demonstrate the persistent enzyme alterations produced by 1,2-dimethylhydrazine (DMH), and the sensitivity of enzyme assay for the detection of such change. Further, the effects of diet suggest that dietary brans cause physiological changes that have the potential to modify colon carcinogenesis. KMD
- 616 OYSTON (E), LOUGH (R) and LOPDYKE (DL). A 90-day toxicity study of phenylethyl alcohol in the rat.
Food Cosmet. Toxicol. 19(6); 1981; 713-5
Phenylethyl alcohol was administered percutaneously to rats at doses of 0.25, 0.50, 1.00, or 2.00 ml/kg body weight/day for 90 days. Weight gain was depressed in both sexes given 1.00 and 2.00 ml/kg, although

no effect on food intake was observed. Survival rate was unaffected, and no ophthalmological defects were observed after 13 weeks. Male rats dosed with 2.00 ml/kg revealed a decrease in haemoglobin concentration and white blood cell count at week 6 and week 13. Organ weight measurements and microscopic examination of several different tissues taken from the batch receiving the highest dose did not reveal any adverse effect. The two lower doses were "no effect" levels. KMD

- 617 WEI (C-D), KITAMURA (K) and SHIBAMOTO (T). Mutagenicity of Maillard browning products obtained from a starch-glycine model system. Food Cosmet. Toxicol. 19(6); 1981; 749-51
Samples from the starch-glycine system showed distinct, dose-related, mutagenic activities towards the *Salmonella typhimurium* strain TA98, with metabolic activation (S-9 mix) both in agar-incorporation and pre-incubation assays. Samples from the starch alone did not show any mutagenic activity towards the same strain, with or without S-9 mix. All of the samples were toxic to the bacteria under certain conditions, at the levels used. Most of the compounds trapped on the Porapak Q column and used in these trials are very volatile, and would generally escape from foods into the atmosphere during cooking. KMD
- 618 HOPKINS (J). Carcinogenicity of carrageenan. Food Cosmet. Toxicol. 19(6); 1981; 779-81
- 619 MARTIN (CRA). The changed pattern of food-borne disease. Br. Food J. 83(905); 1981; 163-5
- 620 STERN (NJ). Discrimination of *Bacillus cereus* from selected *Bacillus* spp. by pyrolysis gas-liquid chromatography. J. Food Sci. 46(5); 1981; 1427-9
- 621 KAPER (JB), REMMERS (EF) and COLWELL (RR). A medium of presumptive identification of *Vibrio parahaemolyticus*. J. Food Prot. 43(12); 1980; 936-8
A medium has been devised for rapid, presumptive identification of *Vibrio parahaemolyticus*. Fermentation of mannitol, sucrose and lactose, arginine dihydrolase, production of indole, gas from carbohydrate and H₂S can be recorded in a single tube of the medium. Because of the ability to test seven characteristics suitable for identifying this species in a single step, the biochemical screening of large numbers of isolates from seafood, water and sediment samples is greatly facilitated. AA
- 622 KOO (FCW) and PETERSON (JW). The influence of nutritional factors on synthesis of *Salmonella* toxin. J. Food Safety. 3(4); 1981; 215-32
- 623 LEWIS (MWA) and WIMPENNY (WT). The influence of nutrition and temperature on the growth of colonies of *Escherichia coli* K 12. Can. J. Microbiol. 27(7); 1981; 679-84
- 624 PUBLIC HEALTH LABORATORY SERVICE AND THE STANDING COMMITTEE OF ANALYSIS. JOINT COMMITTEE. A comparison of confirmatory media for coliform organisms and *Escherichia coli* in water. J. Hyg. 87(3); 1981; 369-75
Gas production by coliform organisms and *Escherichia coli* from lauryl tryptose lactose broth (LTLB) was compared with that from brilliant green (lactose) bile broth (BGB). These media were compared with lauryl tryptose mannitol broth (LTMB) with and without added tryptophan for both gas and indole production. At 37 C, LTLB and BGB were both satisfactory for gas production, but at 44 C, LTLB gave fewer false-negative results and was thus significantly less inhibitory than BGB. However, when LTLB and LTMB were compared as single-tube confirmatory media, LTLB give a high proportion of false-negative reactions in the indole test at 44 C. The substitution of mannitol for lactose and the

addition of tryptophan yielded a satisfactory medium for both confirmation of gas production and the demonstration of indole at 44 C. AA

- 625 HILL (WE). DNA hybridization method for detecting enterotoxigenic *Escherichia coli* in human isolates and its possible application to food samples.
J. Food Safety. 3(4); 1981; 233-47
A DNA hybridization assay was used to detect isolates of *Escherichia coli* that have the genetic potential to produce toxin. This method was compared with the traditional Y-1 mouse adrenal cell method for detecting pathogenic *E. coli* isolated from humans. Results showed that the DNA hybridization method has the potential to detect foodborne bacterial pathogens. The advantages and disadvantages of this genetic method are compared with those of the traditional assays for pathogenicity. AA
- 626 SOLBERG (M), BLASCHEK (HP) and KAHN (P). Plasmids in *Clostridium perfringens*.
J. Food Safety. 3(4); 1981; 267-89
- 627 ROY (RJ), BUSTA (FF) and THOMPSON (DR). Thermal inactivation of *Clostridium perfringens* after growth at several constant and linearly rising temperatures.
J. Food Sci. 46(5); 1981; 1586-91
- 628 IANDOLO (JJ) and DYER (DW). The staphylococcal enterotoxins - A genetic over view.
J. Food Safety. 3(4); 1981; 249-64
- 629 LEELA (RK), SANKARAN (R) and VIJAYA RAGHAVAN (PK). Occurrence of enterotoxigenic staphylococci in raw, processed and ready-to-eat foods. I. Isolation and biochemical characteristics.
Indian J. Nutr. Dietet. 18(6); 1981; 197-203
Three classes of foods namely raw, processed and ready-to-eat were screened for the presence of enterotoxigenic staphylococci. The foods included dehydrated onions, omlette mix, precooked dehydrated curried mixes, intermediate moisture (IM) fruits and vegetables, butter, spice mixes, chapaties, mutton curry, fish curry, raw mutton, bakery products and sweetmeats. Amongst these, butter, meat, fish and egg products gave the highest number of coagulase positive staphylococci and dehydrated vegetables and IM products the least. In bakery products, staphylococci were always associated with cream and coconut fillings. In about to serve dishes, food handlers appear to be the biggest source of contamination. Thermonuclease agar was found to be an ideal medium for demonstrating thermonuclease activity. For phosphatase test, three days incubation at 32 C gave many false positives and hence 37 C for 24 hours is recommended. AA
- 630 RAMANA RAO (MV) and DUTTA (SM). Purification and properties of β -galactosidase from *Streptococcus thermophilus*.
J. Food Sci. 46(5); 1981; 1419-23
- 631 MARTIN (CRA). Mycotoxins in food.
Br. Food J. 83(903); 1981; 102-3, 116
Discusses: research and analysis; *Claviceps purpurea*, ergotism; *Aspergillus* spp. aflatoxins; *Penicillium* spp; *Fusarium* spp; and other mycotoxicosis. BSN
- 632 CLEVSTROM (G), GORANSSON (B), HLODVERSSON (R) and PETTERSSON (H). Aflatoxin formation in hay treated with formic acid and in isolated strains of *Aspergillus flavus*.
J. Stored Prod. Res. 17(4); 1981; 151-61
- 633 BAXTER (CS), WEY (HE) and BURG (WR). A prospective analysis of the potential risk associated with inhalation of aflatoxin contaminated grain dusts.
Food Cosmet. Toxicol. 19(6); 1981; 765-9

A prospective analysis of the potential risk has been performed using information concerning (1) the absorption and carcinogenic effects of another potent carcinogen, benzo(a) pyrene, when adsorbed on to respirable particles, (2) the metabolic capability of cultured human bronchus towards aflatoxins, (3) the irritant nature of respired organic dusts and (4) potential modifying factors known to influence carcinogenic outcome. Suggestions are made regarding the types of information that are still needed in order to adequately assess the risk associated with inhalation of aflatoxin contaminated grain dust. AA

- 634 HOWELL (MV) and TAYLOR (PW). Determination of aflatoxins, ochratoxin A, and zearalenone in mixed feeds, with detection by thin layer chromatography or high performance liquid chromatography.
J. Assoc. Off. Anal. Chem. 64(6); 1981; 1356-63

GENERAL

- 635 LELE (PS). Role of universities and industries in technology of transfer.
Chem. Age India. 32(11); 1981; 997-1002
- 636 SEETHARAMAN (S). Marketing research and futurology.
East. Econ. 77(25); 1981; 1195-7
- 637 SHIELDS (B). Weighing and batching accurately and consistently.
Food Flavour. Ingred. Packag. 3(11); 1981; 29, 31
- 638 BOARD (PW). What are canned foods?
CSIRO Food Res. Q. 41(2); 1981; 29-31
- 639 ANON. Open shelf-life dating of food.
Food Trade Rev. 51(8); 1981; 400-408
A scientific status summary by the Institute of Food Technologists Expert Panel covering aspects like consumer awareness of open dating, perishability of different foods; distribution problems; choices of types of open dates; benefits of open dating; legal status of open dating; and how it could be enforced. KAR

FOOD PROCESSING AND PACKAGING

- 640 SHEPHERD (N). Tailor-made food plants.
Food Manuf. 56(11); 1981; 41, 43
- 641 BRADLEY (B). New trends in flooring for the food factory.
Food Process. Ind. 50(594); 1981; 26
- 642 WOOLEN (A). New uses for reverse osmosis.
Food Eng. Int. 6(9); 1981; 42-3
- 643 BANGS (WE) and REINECCIUS (GA). Influence of dryer infeed matrices on the retention of volatile flavour compounds during spray drying.
J. Food Sci. 47(1); 1982; 254-9
- 644 NAKAI (S). Comparison of optimization techniques for application to food product and process development.
J. Food Sci. 47(1); 1982; 144-52, 176
Modified super-simplex optimisation was compared with several other methods. Mathematical models were used for an objective evaluation of the comparison. MVG
- 645 KAO (J), NAVEH (D), KOPELMAN (IJ) and PFLUG (IJ). Thermal process calculations for different z and j_c values using a hand-held calculator.
J. Food Sci. 47(1); 1982; 193-7
- 646 WELSH (FW) and ZALL (RR). Using zeta potential to optimize coagulating aid doses used to treat food processing wastes.
Process Biochem. 16(4); 1981; 31-3
- 647 SAPERS (GM), PHILLIPS (JG) and DIVITO (AM). Equilibrium pH of home canned foods comprising combinations of low acid and high acid ingredients.
J. Food Sci. 47(1); 1982; 277-80
- 648 WILLIAMS (JR), STEFFE (JF) and BLACK (JR). Economic comparison of canning and retort pouch systems.
J. Food Sci. 47(1); 1982; 284-90

- 649 ROOP (RA) and NELSON (PE). Processing retort pouches in conventional sterilizers.
J. Food Sci. 47(1); 1982; 303-5
A cylindrical rack was designed to hold four 130 mm x 178 mm retortable pouches. The outer dimensions of the cylinder were 157 mm x 178 mm, identical to a No. 10 can. These dimensions permitted pouch processing in traditional sterilizers that accept cans of this size. Dimensional considerations, pouch orientation, and heat distribution were tested in 100% steam. This racking method was found to provide equal heat treatments to all pouches regardless of horizontal, vertical or rolling orientations. These results suggest the use of various conventional sterilizers for pouch processing with little or no modification.
AA
- 650 HOLLAND (RV), ROONEY (ML) and SANTANGELO (RA). New methods of measuring permeabilities of packaging films.
CSIRO Food Res. Q. 41(2); 1981; 47-50

FOOD ENGINEERING AND EQUIPMENT

- 651 FUTTERER (E). Computer assisted drawings. Instrument for rational chemical plant construction.
Chemie-Ingenieur-Technik. 52(11); 1980; 890-2 (German)
- 652 STEPHAN (K). Methods of heat exchange and consequent construction types.
Chemie-Ingenieur-Technik. 52(11); 1980; 863-70 (German)
- 653 SMITH (D). The impact of microprocessors on processed food quality.
Food Flavour. Ingrid. Packag. 3(11); 1981; 38-9, 41
- 654 SMITH (CA) Jr. Flour mill sanitation.
Cereal Food World 26(9); 1981; 451-3

ENERGY IN FOOD PROCESSING

- 655 RUMSEY (TR), SCOTT (EP) and CARROAD (PA). Energy consumption in water blanching.
J. Food Sci. 47(1); 1982; 295-8
The energy consumption of a tubular water blancher and a water blancher with screw conveyor were measured as a basis for suggesting energy conserving modifications. The former required 0.54 MJ/kg and the latter 0.91 MJ/kg indicating the importance of complete steam condensation. A pilot scale experiment with a water blancher heated with heat exchange and by steam injection confirmed the energy savings potential of heating with an exchanger to minimize escape of steam rather than by steam injection. AA
- 656 UNKLESBAY (N). Excessive energy for food distribution associated with food seizures.
J. Food Prot. 44(1); 1981; 47-54
Results of a study were made use of to develop strategies for avoiding excessive energy consumption during food distribution, and recommendations have been made for collection of further data that would facilitate reductions in the amount of energy used to distribute human food. Attention is given mainly to the transportation of food from the producer to the export ports. KMD
- 657 WEISSENBAACH (MJ). Questions on energy saving measures in the fruit juice industry.
Flussiges Obst. 47(6); 1980; 259-67 (German)

FOOD CHEMISTRY AND ANALYSIS

- 658 MESSING (th) and HOFFMANN (G). Industrial crystallization. Modern industrial plant and case studies. Chemie-Ingenieur-Technik. 52(11); 1980; 870-4 (German)
- 659 ALLEN (JC). Interactions of hydrocolloids. Food Flavour. Ingrid. Packag. 3(11); 1981; 23
- 660 LANG (KW), WHITNEY (R McL) and STEINBERG (MP). Mass balance model for enthalpy of water binding by a mixture. J. Food Sci. 47(1); 1982; 110-13
- 661 ROONEY (ML). Oxygen scavenging from air in package headspaces by singlet oxygen reactions in polymer media. J. Food Sci. 47(1); 1982; 291-4, 298
 Oxygen-sensitive foods are frequently packaged under vacuum or with inert-gas flushing. This paper describes a method for oxygen removal from air headspaces in transparent packs by a singlet oxygen reaction in a polymer film. Illumination of a package enclosing a coiled film containing a photosensitising dye and a singlet oxygen acceptor resulted in rapid scavenging of oxygen from the headspace. The results show that the oxygen content of plastic pouches containing air (30 ml) was reduced from 21% to 1% by 6 minute illumination. The scavenging rate depended on the light intensity, and the rate of oxygen diffusion into the polymer. AA
- 662 CAURIE (M). A monolayer equation for use in sorption studies. J. Food Sci. 47(1); 1982; 332-3
- 663 LANG (ER) and RHA (CK). Coating behaviour of suspensions. J. Food Sci. 47(1); 1982; 324-5
- 664 OSINUBI (OA), and EKA (OU). Effect of cooking on the nutritive value of koko/kosai - a traditional breakfast meal of the Hausas in Northern Nigeria. Food Chem. 7(3); 1981; 181-7
 The effect of cooking on the nutritive value of koko-kosai was assessed by chemical analysis. There was significant loss in the proximate composition due to cooking. In addition, losses of some mineral elements and vitamins were observed. The losses in potassium, iron, zinc and phosphorus were found to be 23%, 6.7%, 25% and 13.3%, respectively. Losses of vitamins B₁, B₂, C and carotene were found to be 20%, 46%, 37% and 9.6%, respectively. The amino acid pattern of the koko-kosai was only slightly affected by the traditional method of cooking employed. Some suggestions and recommendations are made on how to retain most of the nutrients when cooking the meals. AA
- 665 NURSTEN (HE). Recent developments in studies on the Millard reaction. Food Chem. 6(3); 1980-81, 263-77
 The complex net work of steps in Maillard reaction is outlined and the chemistry of the production of colour and flavour is dealt with from the point of view of the nature of the components involved and of the mechanisms by which they may be formed. Control of the mechanism has been discussed in the light of the modern developments. KAR
- 666 BOWMAN (BT). Anomalies in the log Freundlich equation resulting in deviations in adsorption K values of pesticides and other organic compounds when the system of units is changed. J. Environ. Sci. Health. B16(2); 1981; 113-23
- 667 MORAN (JJ). Lead content in canned foods containing vinegar. J. Food Sci. 47(1); 1982; 322-3

- 668 ANON. Tackling the nitrate problem.
Food Process. Ind. 50(596); 1981; 23

FOOD LAWS AND REGULATIONS

- 669 PHILIP (M). The weights and measures act.
Food Process. Ind. 50(595); 1981; 26-7

FOOD MICROBIOLOGY

- 670 Da SILVA (EJ). Microbial biotechnology: A global pursuit.
Process. Biochem. 16(4); 1981; 38-41, 44
- 671 ZERVINS (A), BABCOCK (M) and STONE (RW). Survival of microorganisms in a rock bed under conditions simulating solar heat storage.
Appl. Environ. Microbiol. 41(5); 1981; 1107-111
- 672 GHOSH (S). Energy production efficiencies in anaerobic gasification processes.
Process Biochem. 16(4); 1981; 2-7, 12
- 673 WILSON (J). Removal of organics from water by granular activated carbon and microorganisms.
Process Biochem. 16(4); 1981; 9-12
- 674 PASCHOLD (HA). Handling and presentation of data on fermenters with digital systems.
Process Biochem. 16(4); 1981; 27-30
- 675 ROHR (M) and KUBICEK (CP). Regulatory aspects of citric acid fermentation by *Aspergillus niger*.
Process Biochem. 16(4); 1981; 34-7, 44
- 676 WEBSTER (IA) and SHULER (ML). Multiple steady-state phenomena within enzyme reactors: The enzyme reaction with two substrates.
Biotechnol. Bioeng. 23(5); 1981; 939-52
- 677 SADA (E), KATOH (S) and TERASHIMA (M). Enhancement of oxygen absorption by magnetite-containing beads of immobilized glucose oxidase.
Biotechnol. Bioeng. 23(5); 1981; 1037-44
- 678 KIKKERT (A), VELLENGA (K), De WILT (HGJ) and JOOSTEN (GEH). The isomerization of D-glucose into D-fructose catalysed by whole-cell immobilised glucose isomerase. The dependence of the intrinsic rate of reaction on substrate concentration, pH, and temperature.
Biotechnol. Bioeng. 23(5); 1981; 1087-1101
- 679 GLEISER (IE) and BAUER (S). Growth of *E. Coli* W to high cell concentration by oxygen level linked control of carbon source concentration.
Biotechnol. Bioeng. 23(5); 1981; 1015-21
- 680 REVAH-MOISEEV (S) and CARROAD (PA). Conversion of the enzymatic hydrolysate of shellfish waste chitin to single-cell protein.
Biotechnol. Bioeng. 23(5); 1981; 1067-78

YEAST

- 681 KALOGERAKIS (N) and BOYLE (TJ). Experimental evaluation of a quasi-steady-state controller for yeast fermentation.
Biotechnol. Bioeng. 23(5); 1981; 921-38

- 682 SHETTY (JK), WEAVER (RC) and KINSELLA (JE). Ribonuclease isolated from yeast (*Saccharomyces carlsbergensis*): Characterization and properties. Biotechnol. Bioeng. 23(5); 1981; 953-64
- 683 DEKKERS (JGJ), de KOK (HE) and ROELS (JA). Energetics of *Saccharomyces cerevisiae* CBS 426: Comparison of anaerobic and aerobic glucose limitation. Biotechnol. Bioeng. 23(5); 1981; 1023-35

AL GAE

- 684 GOLDMAN (JC), DENNETT (MR) and RILEY (CB). Inorganic carbon sources and biomass regulation in intensive microalgal cultures. Biotechnol. Bioeng. 23(5); 1981; 995-1014
- 685 OGAWA (T) and AIBA (S). Bioenergetic analysis of mixotrophic growth in *Chlorella vulgaris* and *Scenedesmus acutus*. Biotechnol. Bioeng. 23(5); 1981; 1121-32

FUNGI

- 686 THOMPSON (DP), SMALLEY (AW) and ERIBO (BE). Fungal metabolite from members of the genus *Rhizopus*. Appl. Environ. Microbiol. 41(5); 1981; 1271-3

FOOD ADDITIVES

- 687 LOLIGER (J) and SAUCY (F). Rapid determination of antioxidants with an electrochemical microflow-through detector. Part I. Determination of tocopherols. Z. Lebensmittel-Unters. Forsch. 170(6); 1980; 413-6
An electrochemical method for determining tocopherols in oils, fats, and fat-containing foods is presented. The use of an electrochemical detector brings the detection limit down to 10^{-8} mole/l tocopherol. AA
- 688 RESTAINO (L), KOMATSU (KK) and SYRACUSE (MJ). Effects of acids on potassium sorbate inhibition of food related microorganisms in culture media. J. Food Sci. 47(1); 1982; 134-8, 143
Effects of potassium sorbate in combination with citric, lactic, phosphoric, and hydrochloric acids on the growth of six food-related microorganisms were studied. Trypticase soy broth with 0.1 or 0.2% sorbate adjusted to pH 5.5 with any of the acids was bacteriostatic to *Yersinia enterocolitica* 0:17. These combinations at pH 5.5 were also bacteriostatic to *Salmonella* group D, and extended the lag phase of *Pseudomonas fluorescens* for 24 hours. Combinations of either organic acid with 0.2% sorbate at pH 5.5, reduced the growth rate of *Lactobacillus plantarum* and an unidentified *Lactobacillus* isolated from frankfurters. *Pseudomonas aeruginosa* was unaffected by any sorbate-acid combination. Organic acids, specifically citric and lactic, potentiate the antimicrobial action of potassium sorbate. AA
- 689 FOX (JB) Jr., FIDDLER (RN) and WASSERMAN (AE). Initial reaction intermediates in the oxidation of ascorbic acid by nitrous acid. J. Food Prot. 44(1); 1981; 28-32
Nitrite and ascorbate react to form nitric oxide at pH 5.5. In the initial stages of the reaction, seven intermediates, including two colourless nitroso derivatives that contain 30-60% of the initial nitrite, could be identified by spectrometry and chromatography. The intermediates have been isolated and characterized, and a sequence has

been proposed for the initial steps in the oxidation of ascorbic acid by nitrous acid. KMD

- 690 RACCACH (M) and HENNINGSEN (EC). Antibacterial effect of tertiary butylhydroquinone against two genera of gram positive cocci. J. Food Sci. 47(1); 1982; 106-9
The effect of tertiary butylhydroquinone (TBHQ) on the fermentative activity of *Pediococcus pentosaceus* and *Staphylococcus aureus* was extensively evaluated. It was shown that TBHQ inhibited the growth of both *P. pentosaceus* and *S. aureus* too but was inactive against *S. aureus* z-88. TBHQ inhibited lactic acid production by *P. pentosaceus* but had little or no effect on nuclease production in *S. aureus* z-88. In fat containing food product, like meat, the effect of TBHQ and other phenolic antioxidants was smaller than in a laboratory medium. further study was suggested to elucidate the mode of action and characterise the optimal conditions for the antimicrobial activity of TBHQ and similar antioxidants. MVG
- 691 PAINE (H). Flavour legislation: The pros and cons. Food Flavour. Ingrid. Packag. 3(11); 1981; 16-7
- 692 BROGLE (H). Flavour extraction by high-pressure CO₂. Food Flavour. Ingrid. Packag. 3(11); 1981; 19, 21

CEREALS

- 693 SUAREZ (C), CHIRIFE (J) and VIOLLAZ (P). Shape characterization for a simple diffusion analysis of air drying of grains. J. Food Sci. 47(1); 1982; 97-100, 157
- 694 MARCHANT (JL) and BLANSHARD (JMV). Changes in the birefringent characteristics of cereal starch granules at different temperatures and water activities. Starch. 32(7); 1980; 223-26
- 695 POPINEAU (Y) and GODON (B). Surface hydrophobicity of gliadin components. Cereal Chem. 59(1); 1982; 55-62
- 696 SEILER (K). Raw materials and extrusion: Behaviour of a few cereal-based raw materials during the extrusion process. Gordian. 80(10); 1980; 235-42 (German)
The behaviour of some cereals products, like maize semolina, wheat, rice, bran, soya protein isolate, in a HTST extrusion press has been described, using data already reported in the literature. In the extruder, the biopolymers (starch and protein) present in mass are denatured by the opening of their quarternary and vertiary structures. The HTST extrusion process is therefore, a typical texturization process that converts granular and powdery raw materials into a plastic, viscous mass which expands explosively when it comes out of the nozzle. KMD

RICE

- 697 NISHITA (KD) and BEAN (MM). Grinding methods: Their impact on rice flour properties. Cereal Chem. 59(1); 1982; 46-9
Of the seven different mills employed for grinding medium grain broken rice to flour, burr and blade mills yielded coarse flours, roller mill, an intermediate flour and pin hammer and turbo mills, fine flour. Coarse flours with less damaged starch functioned better in 100% rice flour breads. For composite flour breads, containing 30% rice, finer flours with more damaged starch were found suitable. Anylograph visco-

sity showing an initial increase started at a lower temperature for fine flours than for coarse types. Different endotherms (T_{max}) that paralleled microscopic gelatinization temperatures were observed in six rice flours of different particle sizes subjected to differential scanning calorimetry. Enthalpies obtained by this technique were lower for flours with a higher degree of damaged starch. BSN

- 698 WADSWORTH (JI), MATTHEWS (J) and SPADARO (JJ). Milling performance and quality characteristics of starbonnet variety rice fractionated by rough rice kernel thickness.

Cereal Chem. 59(1); 1982; 50-54

Processing of thinner rice kernels (<1.6 mm) separately, leads to the possibility of producing a new high protein product, with excellent protein quality. Further, it also reduces processing losses and energy required to dry rice, while an improvement in quality of milled rice products is also observed. BSN

- 699 PEIL (A), BARRETT (F), RHA (C) and LANGER (R). Retention of micronutrients by polymer coatings used to fortify rice.

J. Food Sci. 47(1); 1982; 260-62

Our objective was to design a rice-fortification method using materials approved for use in foods to retain significant quantities of added nutrients during the common practice of boiling rice in excess water and draining it. We accomplished this by applying nutrients to rice in edible polymer coatings. Various starches and cellulosic polymers were evaluated with respect to flexibility, strength, stickiness and nutrient retention. Combining hydroxypropyl methylcellulose and methylcellulose (3:1) gave the best results. Nutrient retentions for 1 g of coated rice cooked in 100 ml water and drained were: Vitamin A, 70%; iron, 100%; niacin, 18%; thiamin, 18%, riboflavin, 21%. AA

- 700 NOGUCHI (A), KUGIMIYA (W), HAQUE (Z) and SAIO (K). Physical and chemical characteristics of extruded rice flour and rice flour fortified with soyabean protein isolate.

J. Food Sci. 47(1); 1982; 240-45

Texturized products were produced from rice flour and rice flour fortified with Soy Protein Isolate (SPI) by extrusion cooking. Water absorption capacity (WA) of the extrudates was slightly depressed in the presence of SPI. Scanning electron microscopy revealed that the fine structure of the textured products differed substantially from each other and that SPI formed fine strings in the starch matrix. Solubility tests indicated that thermoplastic extrusion processing increased non-covalent interaction and disulphide bonding resulting in decreased protein solubility. 7S subunit of the soy protein seemed more affected than the 11S component. Insolubilization was significantly less when rice flour and SPI were processed simultaneously indicating a sparing effect in their mutual presence. AA

WHEAT

- 701 UMETSU (H), ABE (M), SUGAWARA (Y), NAKAI (T), WATANABE (S) and ICHISHIMA (E). Purification, crystallisation and characterisation of carboxypeptidase from wheat bran.

Food Chem. 7(2); 1981; 125-38

- 702 HUBBARD (JD), LAI (FS), MARTIN (CR), MILLER (BS) and POMERANZ (Y). Amino acid composition of grain dusts.

Cereal Chem. 59(1); 1982; 20-22

Amino acid composition of wheat, corn, grain sorghum, soybeans, a wheat-corn mixture and rice and dusts from these grains, were determined by automated ion-exchange chromatography. As compared to corresponding protein content of grains, dust contained about 2-3% (dry basis) protein in lower amounts, except for soyabean where it was 13%,

as against 41% for whole soyabean. Lysine concentration was higher in each of the dusts, as compared to corresponding grains, except soyabean dust. BSN

- 703 YAMAZAKI (WT) and ANDREWS (LC). Experimental milling of soft wheat cultivars and breeding lines.
Cereal Chem. 59(1); 1982; 41-5

A four-stand Allis Chalmers experimental mill was modified to improve precision in milling soft wheat and was then used to compare three milling procedures. A six-break, variable-roll, variable reduction-pass system was found to be best suited to accommodate the diverse types of soft wheat cultivars and breeding lines. A milling characteristic termed endosperm separation index, which appeared to be a measure of ease of separation of endosperm and bran, was found to be associated with yield of straight-grade flour. AA

- 704 DEXTER (JE) and MATSUO (RR). Effect of smudge and blackpoint, mildewed kernels, and ergot on durum wheat quality.
Cereal Chem. 59(1); 1982; 63-9

Farm samples from the 1979 and 1980 Canadian durum wheat crops were handpicked to yield a series of controls and samples enriched by varying degrees in smudge and blackpoint, mildewed kernels, and ergot bodies. The most important effect of smudge and blackpoint and of mildewed kernels was an undesirable increase in semolina speckiness. Spaghetti colour also deteriorated slightly, particularly from mildewed kernels. Levels of ergot bodies within the legally tolerated limits for Canadian durum wheat caused an increase in semolina speckiness. At higher levels of ergot, spaghetti colour deteriorated rapidly and milling yield decreased. Spaghetti cooking quality did not appear to be affected by any of the degrading factors examined. AA

- 705 CHUNG (OK), POMERANZ (Y) and FINNEY (KF). Relation of polar lipid content to mixing requirement and loaf volume potential of hard red winter wheat flour.
Cereal Chem. 59(1); 1982; 14-20

- 706 BAKHOUM (MT) and PONTE (JR) Jr. Combined effects of sodium chloride and hydrochloric acid on wheat flour strength.
Cereal Chem. 59(1); 1982; 37-40

- 707 LOOKHART (GL), HALL (SB) and FINNEY (KF). Determination of ascorbic acid in wheat flours, bread dough conditioners, and commercial vitamin C tablets by high performance liquid chromatography.
Cereal Chem. 59(1); 1982; 69-71

- 708 PRESTON (KR). Gel filtration of wheat gluten proteins on Sephacryl S-300.
Cereal Chem. 59(1); 1982; 73-5

- 709 INDA (AE) and RHA (C). Rupture properties of wheat gluten in simple tension: The role of hydrogen bonds.
J. Food Sci. 47(1); 1982; 177-80

Gluten obtained from hard red winter wheat flour was freeze-dried and reconstituted with deuterium oxide and aqueous solutions of urea to selectively alter the extent of hydrogen bonding. The rupture properties of the modified glutes were studied in simple tension at seven rates of strain covering three orders of magnitude (2.86×10^{-2} to 28.6 min^{-1}). Tensile strength and rupture strain decreased steadily with the extent of hydrogen bonding disruption, i.e., with increase in urea concentration. For a given type of modified gluten, the strain at rupture was independent of the rate at which the material was deformed and the tensile strength increased with increasing deformation rate. AA

- 710 KRUGER (JE) and MATSUO (RR). Comparison of alpha-amylase and simple sugar levels in sound and germinated durum wheat during pasta processing and spaghetti cooking. Cereal Chem. 59(11); 1982- 26-31
 Sugar and α -amylase levels of ungerminated and germinated durum wheats were compared at various processing stages. α -Amylase levels in the wheat germinated for 72 and 120 hours increased 155-fold and 320-fold, respectively. Processing into semolina and spaghetti decreased α -amylase levels in both ungerminated and germinated samples. When spaghetti was cooked, α -amylase was present in the germinated sample for at least 6 minutes of boiling. The levels of glucose and sucrose increased approximately 50% on germination, whereas the maltose level doubled. Conversion to the respective semolinas decreased sugars, whereas processing into spaghetti increased maltose and glucose. Cooking of spaghetti did not increase the total amount of a particular sugar in the solid and the cooking water combined. Increased cooking time, however, released more sugars as well as residue into the cooking water and decreased the sugars in the solid. Part of the cooking water residue was comprised of high molecular weight dextrins. Because spaghetti made from germinated wheat had a higher initial concentration of free sugars, loss of such sugars into the cooking water was correspondingly greater. AA
- 711 MEREDITH (P), PENGATE (HN), HENNESSY (W), BLUNT (JW), HARTSHORN (MP) and MUNRO (M-H-G). Saccharides of developing wheat grain determined by ^{13}C -NMR spectroscopy. Starch. 32(6); 1980; 198-205
- 712 LORENZ (K) and KULP (K). Steeping of starch at various temperatures: Effects on functional properties. Starch. 32(6); 1980; 181-6
 Functionality of wheat starches steeped at various time and temperature conditions was studied in bread, cake, and pie filling systems. Treatment at 50 C reduced the bread volume. Crumb softness in breads increased with duration and temperature of the treatment. Addition of 3-10% (flour basis) treated starch (40 C for 3 days) reduced firmness of breads. Cakes with starches treated at 25 C and 40 C upto 3 days were acceptable; starch treatment at 50 C caused collapse of cakes. The consistencies of pie fillings increased by starch treatment at 25 C. Treatment at higher temperatures (40 - 50 C) of starches caused high initial consistencies of fillings which were reduced during storage. AA
- 713 BOWLER (A), WILLIAMS (MR) and ANGOLD (RE). A hypothesis for the morphological changes which occur on heating lenticular wheat starch in water. Starch. 32(6); 1980; 186-9
 A model for the changes in shape of lenticular wheat starch granules during gelatinization and subsequent swelling is proposed. This suggests that swelling occurs, essentially, in the plane of the two major axes only. The swelling is a two stage process; radial expansion to form a flattened disc, followed by tangential expansion to produce a complex puckered granule. The model, based on microscopic observations using a range of techniques, is in agreement with the current views on the structure and biosynthesis of the starch granule, and can be related to the structure of granules extracted from a variety of processed food products. AA
- 714 RAM (BP) and NIGAM (SN). Puffing and textural characteristics of chapati in relation to varietal difference in gluten composition. J. Food Sci. 47(1); 1982; 231-3
 Chapaties made from different wheat varieties differ in puffing and textural characteristics. These differences have been found to be related to the relative quantities of gliadins, glutenins and residue proteins in respective glutes. Wheat varieties having about equal quantities of gliadins, glutenins and residue proteins give fully puffed

soft and pliable chapaties. Wheat varieties having more of residue protein give leathery chapaties and varieties having more of gliadin give relatively stiff chapaties. Applications of Warner-Bratzler shear press for evaluating chapati texture is discussed. AA

MILLETS

PEARL MILLET

- 715 De FRANCISCO (A), SHEPHERD (AD), HOSENEY (RC) and VARRIANO-MARSTON (E). Decorticating pearl millet and grain sorghum in a laboratory abrasive mill.

Cereal. Chem. 59(1); 1982; 1-5

The decortication behaviour of random mating populations of pearl millet and cultivars of grain sorghum was studied with Shepherd's modification of the Udy cyclone mill. Sorghum bran was removed in large flakes during decortication, and pearl millet bran was removed in smaller flakes. Neither sorghum nor millet was degermed during decortication. Millets grown in Sudan required less time to decorticate than Kansas-grown millets. Fractionation of the decorticate and the decorticated grain, using screens and a seed blower, indicated that differences in decortication rate were largely related to endosperm softness. AA

- 716 De FRANCISCO (A), VARRIANO-MARSTON (E) and HOSENEY (RC). Hardness of pearl millet and grain sorghum.

Cereal Chem. 59(1); 1982; 5-8

The hardness of various populations of pearl millet and cultivars of grain sorghum was determined by particle size analysis after the grains were milled on attrition and roller mills. Millets grown in Sudan were, in general, softer than Kansas-grown ones. However, kernel vitreousness did not parallel grain hardness as determined by particle size analysis. Furthermore, tempering either millet or sorghum before milling shifted the particle distribution to larger sizes compared with those of nontempered samples. AA

MAIZE

- 717 MIWA (T). Studies on corn steeping.
J. Jpn. Soc. Starch Sci. 28(1); 1981; 41-9 (Japanese)

- 718 SUZUKI (H) and ISHIKAWA (T). Studies on inclusion in intra- and inter-chain of polysaccharide molecules (IV). On the properties of globular precipitate produced from the hot solution of oxidized corn starch.
J. Jpn. Soc. Starch Sci. 28(1); 1981; 16-23 (Japanese)

Globular particles (6.7 μ m in diameter) was precipitated from the hot solution, 10% of a commercial oxidized corn starch. The following properties of the precipitate and related substances were investigated: (1) X-ray diffraction pattern; (2) intrinsic viscosity in 1N KOH and dimethyl sulphoxide; (3) absorption spectrum of colour solution with iodine; (4) iodine affinity value; (5) chain length by the oxidation method with periodate; (6) limit of β -amylolysis. From those results, it was found that the precipitate was the microcrystal of amylose-lipid complex in which mean chain length of amylose was about 100 anhydroglucose unit. AA

- 719 STROCCHI (A). Fatty acid composition and triglyceride structure of corn oil, hydrogenated corn oil and corn oil margarine.
J. Food Sci. 47(1); 1982; 36-9

Data on natural and altered fatty acid composition and triglyceride structure of corn as a result of the hydrogenation process used to produce margarine, are reported. The above parameters as altered by hydrogenation were found specific to hydrogenated corn oil and not comparable

to composition and structure of natural lipids of either vegetable or animal origin. The hydrogenated oil contained double bond configurational and positional isomers comparable to vegetable oils; they also contained higher net quantities of TUFA (upto 59.1%) like animal oils and had them preferentially located in the position of the triglyceride. MVG

- 720 SEITZ (LM), SAUER (DB), MOHR (HE) and ALDIS (DF). Fungal growth and dry matter loss during bin storage of high-moisture corn. Cereal Chem. 59(1); 1982; 9-14

Carbon dioxide, ergosterol, aflatoxin, per cent of kernels with fungi, moisture contents, and temperatures were monitored during storage of freshly-harvested, high-moisture (22.9-25.6%) corn in 1978 and 1979. The corn was stored in two 100-bu bins and aerated from the bottom at 0.17-0.66 m³/min./t. Fungal invasion was highest at the top and lowest at the bottom of the bins. The tests showed that 1) fungal invasion and aflatoxin content could be unacceptable before the grain lost 0.5% dry matter, and 2) the initial amount of inoculum, particularly *Aspergillus flavus*, on the grain significantly affected the extent of fungal invasion during storage. Standard visual inspection procedures did not adequately reveal the fungal contamination in samples of the corn when surface mold was removed by agitation in a stream of air. AA

PULSES

- 721 FLEMING (SE). Influence of cooking method on digestibility of legume and cereal starches. J. Food Sci. 47(1); 1982; 1-3

Starches from cereals (wheat, normal corn and high amylose corn), legumes (field pea, kidney bean and mung bean) and potato starch and glucose were evaluated as carbohydrate sources. The starches were cooked by different methods before being fed. Raw starch was also used in the studies. Results showed that, except for potato and high-amylose corn, cooking provided no nutritional advantage as no significant differences were evident in weight gain, feed efficiency ratio, or apparent protein digestibility. MVG

- 722 PILOSOF (AM), BARTHOLOMAI (GB) and CHIRIFE (J). Kinetics of nitrogen solubility loss in heated flour and protein isolates from bean, *Phaseolus vulgaris*. J. Food Sci. 47(1); 1982; 4-7

Loss of nitrogen solubility in the products studied on cooking followed in almost all cases, first-order reaction kinetics, a behaviour which is associated with various deteriorative reactions in food systems. Increasing moisture content increased rate of solubility loss in both cases; protein isolate was more heat sensitive than flour possibly due to the increased concentration of the protein reacting species. MVG

- 723 USHA CHANDRASHEKAR, LALITHA (B) and RAJAMMAL DEVADAS (P). Evaluation of protein quality of raw, roasted and autoclaved legumes supplemented with sulphur containing amino acids. Indian J. Nutr. Dietet. 18(8); 1981; 283-8

Three legumes (Bengal gram (*Cicer arietinum*), green gram (*Phaseolus aureus* Roxb) and horse gram (*Dolichos biflorus*)) as raw ground powder, roasted powder (100-110° for 5 minutes as ground with powder) and pressure cooked powder (autoclaved at 15 lb pressure for 20 minutes, cooked, dried and powdered) were fed to rats as such or on sulphur amino acids (cystine or methionine at 10% of the protein levels; and assessed for their protein quality through rat growth studies. It was found that, in general, processing improved protein quality of legumes. In case of autoclaved legumes, addition of cystine or methionine improved protein quality significantly. AA

- 724 HALABY (GA), LEWIS (RH) and REY C(R). Variations in nutrient content of commercially canned legumes. J. Food Sci. 47(1); 1982; 263-6

BENGAL GRAM

- 725 KHADER (V) and VENKAT RAO (S). Digestibility of carbohydrates of raw and cooked Bengal gram (*Cicer arietinum*), green gram (*Phaseolus aureus*) and horse gram (*Dolichos biflorus*). Food Chem. 7(4); 1981; 267-71

In vitro digestion with pancreatin, preceded by pepsin, increased the rate of liberation of maltose from soaked Bengal gram, green gram and horse gram on blending first in water prior to cooking instead of cooking first before blending. However, the faecal bulk and caecal volume were not significantly different when the legumes were fed to rats after cooking as such, or cooking prior to, or after, blending. The results indicate that increasing the rate of digestion of carbohydrates may not be of value in reducing the flatulence caused by these legumes. AA

CHICK PEA

- 726 JAYA (TV) and VENKATARAMAN (LV). Changes in the carbohydrate constituents of chick pea and green gram during germination. Food Chem. 7(2); 1981; 95-104

A decrease in the concentration of total carbohydrates was observed during 96 hours; germination of chickpea and greengram. However, whilst the starch and oligosaccharide levels decreased, the reducing sugars increased. Starch was the major carbohydrate and about 50% of it was hydrolysed after 96 hours' germination. The amylose proportion of the starches increased during germination. Starches from germinated chickpea and greengram had better swelling power and solubility, but their intrinsic viscosity was lower. Changes occurred in the concentration of hemicellulose during germination but their composition did not alter. The above-mentioned changes, occurring during germination, appear to have a favourable effect on the nutritional value of chickpea and greengram. AA

FIELD BEAN

- 727 RAMAMANI (S) and SUBRAMANIAN (N). Nitrogen balance studies with green field bean (*Dolichos lablab*). Indian J. Nutr. Dietet. 18(8); 1981; 289-93

80% ethanol extraction of green field bean improved the BV, TD and NPU of the proteins as determined by N balance technique. However, heat processing is essential to get the maximum values for BV, TD and NPU. 80% ethanol extraction and subsequent heat processing significantly improved the TD of the proteins. NPU values as determined by the body N technique was found to be negative for raw green field bean meal, while 80% ethanol extraction or dilute acid extraction of the meal gave positive though, low values. Thus 80% ethanol extraction excludes certain antinutritive factor(s) from green field bean which gave a significant effect on the utilization of the proteins *in vitro*. AA

- 728 TYLER (RT) and PANCHUK (BD). Effect of seed moisture content on the air classification of field peas and faba beans, Cereal Chem. 59(1); 1982; 31-3

Starch and protein concentrates were prepared by pin milling and air classifying dehulled samples of field peas and faba beans containing 3.8-14.3% moisture. Seed moisture content affected both the yield and the composition of the air-classified fractions. Reductions in seed moisture were accompanied by decline in starch fraction yield,

protein contents of the starch and protein fractions, and starch separation efficiency. In contrast, protein fraction yield, starch contents of the starch and protein fractions, protein separation efficiency, and neutral detergent fiber content of the protein fraction were greater at lower seed moistures. Two measures of seed hardness, one based on grinding time and the other on fineness of grind, revealed an increase in hardness at lower moisture contents. Increases in seed hardness were paralleled by increases in impact milling efficiency. Lower rates of feed to the air classifier (at a particular feed-gate setting) were observed at lower flour moistures. However, no improvement in the sharpness of the separation at lower feed rates was detected. AA

- 729 FLEMING (SE). Flatulence activity of the smooth-seeded field pea as indicated by hydrogen production in the rat. J. Food Sci. 47(1); 1982; 12-5

Distribution of flatulence-causing components within the seeds of smooth-seeded field peas, was evaluated. Fractionation of the seeds provided components widely differing in composition. The cell-wall fibre fraction was rich in neutral-detergent fibre (NDF) and ash, and the starch fraction contained starch and small quantities of NDF. In the fibre fraction, starch content was 49%. It was also found that components separated by fractionation could be recombined without significantly effecting the hydrogen produced by the laboratory rat. Flatulence activity, as measured by hydrogen production, appeared to be equally due to indigestible oligosaccharides and cell-wall fibre constituents. While the oligosaccharides which include raffinose, stachyose and verbascose have been claimed to cause flatulence, the water insoluble fraction of the cell-wall constituents also appears to be a major contributor to flatulence. The nature of these carbohydrates, however, has yet to be elucidated by enzymatic and hydrolysis procedures. MVG

GREAT NORTHERN BEAN

- 730 SATHE (SK), IYER (V) and SALUNKHE (DK). Functional properties of the Great Northern bean (*Phaseolus vulgaris* L.) proteins. Amino acid composition, *in vitro* digestibility, and application to cookies. J. Food Sci. 47(1); 1982; 8-11, 15

Flour, albumins, globulins, protein concentrates and isolates were obtained from Great Northern bean were studied for amino acid composition, *in vitro* digestibility and alkaline water retention capacity. Flour proteins, albumins and protein isolates contained high amounts of acidic amino acids, while globulins and protein concentrates contained high amounts of hydrophobic amino acids. Ratio of essential amino acids to total amino acids (E/T%) was highest for protein concentrates followed by globulins, albumins, protein isolates and flour proteins in decreasing order. Protein isolates had the lowest chemical scores. The limiting amino acids were sulphur amino acids in flour proteins, albumin and protein isolates, and was leucine for globulins and protein concentrates. Trinitrobenzene sulphonic acid (TNBS) assay gave the *in vitro* digestibility of flour protein, albumins, globulins, protein concentrates and isolates as 9.30, 2.73, 10.09, 13.60 and 28.59% respectively. The proteins were resistant to *in vitro* enzymatic attack. Moist heat improved digestibility more than dry heat. In studies with cookies containing bean proteins, it was found that, during dough mixing, the dough became stiffer as the proportion of bean flour or protein concentrates increased more so in the case of latter. The effect was attributed to increased water absorption capacity of the blends. During baking, collapse occurred more with doughs containing bean flour than with those with protein concentrates. The final diameter of the cookies which can reflect the collapse of the structure was negatively correlated to alkaline water retention capacity of blends of wheat flour with bean flour ($r = -0.90$) and protein concentrates ($r = -0.93$). MVG

GREEN GRAM

- 731 HAIDER (FG). Inactivation studies on the trypsin inhibitor activity of green gram cultivars.
 Nutr. Rep. Int. 26(6); 1981; 1167-71
 Dry heat, moist heat, soaking, autoclaving, gamma irradiation and germination were tried for inactivation of trypsin inhibitor (T_1) in 8 cultivars of green gram having varying levels of tryptic inhibitor activities. Maximum distribution T_1 using dry heat and moist heat were 43.6 and 59.69% and in the case of soaking autoclaving, and soaking plus autoclaving treatments, they were 28.5, 67.1 and 75.1% respectively. Radiation upto 400 Krad was found to have insignificant effect on T_1 contents. Germination resulted in a decrease of T_1 of about 30%. KAR

SNAP BEAN

- 732 VAN BUREN (JP) and PECK (HN). Effect of K fertilization and addition of salts on the texture of canned snap bean pods.
 J. Food Sci. 47(1); 1982; 311-3

WINGED BEAN

- 733 EKPENYONG (TE) and BORCHERS (RL). Extraction of the proteins of winged bean seeds.
 Nutr. Rep. Int. 23(6); 1981; 1055-61
 The proteins of winged bean are more soluble at very alkaline than either neutral or acid pH with a point of minimum solubility occurring at pH 4 and the point of maximum dispersion occurring at pH 2.0. The precipitation curve was also pH dependent. Sodium hydroxide was the most effective solvent, but not as effective as the pure distilled water. KAR

OILSEEDS AND NUTS

GROUNDNUT

- 734 KNAUFT (DA), NORDEN (AJ) and BENINATI (NF). Effects of intrarow spacing on yield and market quality of peanut (*Arachis hypogaea* L.) genotypes.
 Peanut Sci. 8(2); 1981; 110-12
- 735 WILLIAMS (EJ) and DREXLER (JS). A non-destructive method for determining peanut pod maturity.
 Peanut Sci. 8(2); 1981; 134-41
 A method of classification based on colour and morphological differences of the mesocarp is described for determining the developmental stages of fresh peanut (*Arachis hypogaea* (L) Florunner) pods. Developmental stages are designated as Classes 1-7, with each subsequently numbered class representing progressively greater degrees of maturity. Maturity determination by this method requires removal of a portion of the exocarp or epidermis to expose the pod mesocarp. The exocarp can be removed by sand blasting, gentle abrasion, or lightly scraping with a knife. Because removal of the exocarp is non-destructive to the remaining pod structure and enclosed seeds, the method has inherent advantages for use in commercial culture and in biological investigations requiring intact pods and or seed. AA

- 736 McLEAN (DE) and SULLIVAN (GA).. Influence of cultural and harvest practices on peanut seed quality. Peanut Sci. 8(3); 1981; 145-8

Managing peanut (*Arachis hypogaea* L.) production for maximum yields often results in poor-quality seed being produced. The objectives of this study were (1) to identify relationships between production practices and seed quality and (2) to evaluate the impact of harvesting and handling procedures on seed germination quality. Combining significantly reduced germination by an average of 9% for three years. Artificial drying had little effect on average seed quality. Percentage germination was significantly correlated with soil fertility, soil particle size, pod moisture, seed calcium, market grade and hull damage with the most consistent correlations occurring between seed calcium and germination. In general, the correlations were small, and no single production factor accounted for a large proportion of the variability found for seed quality. AA

- 737 BHUCHAR (VM) and AGRAWAL (AK). Multi-purpose automatic solvent extractor. Analyst. 106(1263); 1981; 620-24

A multi-purpose solvent extractor has been modified to be automatic and continuous in operation. This modification has the added advantages of requiring less solvent than the earlier apparatus and of minimising decomposition and charring of the extracted constituent. A sampling port is provided for on-line control sampling of the extract. The apparatus has been used for defatting whole groundnut kernels with hexane, and for the extraction of caffeine from aqueous solution with trichloroethylene. AA

- 738 BADAMI (RC), SHIVAMURTHY (SC), JOSHI (MS) and PATIL (KB). Yield characters and chemical examination of five varieties of hybrid bunch type peanuts with respect to their parents. Fette Seifen Anstrichm. 82(10); 1980; 400-401

Five varieties of oils from hybrid bunch type peanuts, viz. Dh 7.32, Dh 3.30, Dh 3.20 and Dh 2.4 and their parents, spanish improved and VS-4 have been analysed for their fatty acid composition with the following results: oil content 43.5 to 48.5%, iodine value 95.8 to 98.9, protein content 43.1 to 49.3%, saturated acids 22.2 to 31.1% and unsaturated acids 68.2 to 76.3%. All varieties contain palmitoleic acid ranging from 0.6 to 1.5%. AA

- 739 HO (C-T), LEE (M-H) and CHANG (SS). Isolation and identification of volatile compounds from roasted peanuts. J. Food Sci. 47(1); 1982; 127-33

From the volatile flavour compounds isolated from freshly roasted peanuts (70 kg), a total of 131 compounds were identified. Some of the compounds have been reported for the first time. MVG

- 740 BASHA (S-MM) and PANCHOLY (SK). Polypeptide composition of arachin and non arachin proteins from early bunch peanut (*Arachis hypogaea* L.) seed. Peanut Sci. 8(2); 1981; 82-8

Peanut (*Arachis hypogaea* L.) seed proteins were resolved into arachin and non arachin fractions, and composite two-dimensional polypeptide maps were prepared. Seed proteins were extracted with a buffer containing 2 M NaCl, 10 mM Tris-HCl (pH 8.,2), 0.2 mM phenylmethyl sulphonyl fluoride and 0.002% NaN₃ and resolved into ten peaks by gel filtration on a Sephacryl S-300 column. Gel filtration of total protein extract yielded three molecular weight variants (490,000., 400,000 and 365,000) of arachin. Gel electrophoresis showed quantitative and qualitative differences in the protein and polypeptide composition of the three arachin variants. Nonarachin proteins obtained by this method were heterogeneous and distinct from the arachin. Two-dimensional gel electrophoresis revealed several differences in the polypeptide composition between arachin fraction IV and fractions II and III. Composite two-

dimensional polypeptide maps of arachin and non arachin revealed the presence of several polypeptides with similar isoelectric points and molecular weights between them. Arachin contained six molecular weight (between 15,500 and 68,000) classes of polypeptides with isoelectric points between 4.7 and 8.4 while nonarachin contained nine molecular weight (between 16,000 and 170,000) classes of polypeptides having isoelectric points between 4.7 and 7.9. AA

- 741 HSI (DCH), YOUNG (CT) and ORTIZ (M). Effect of growing seasons, locations and planting dates on total amino acid composition of two Valencia peanut varieties grown in New Mexico. Peanut Sci. 8(2); 1981; 131-3

Two Valencia peanut (*Arachis hypogaea* L.) cultivars, New Mexico Valencia A and New Mexico Valencia C, were grown at Arch and Los Lunas, N.M. All peanuts were grown under either sprinkler or furrow irrigation. Samples were obtained following harvest, hydrolyzed and analyzed in Raleigh, N.C. for amino acid content. With samples from Arch, no variety by planting date effects were noted for amino acid composition. With samples from Los Lunas, however, significant variety by planting date effects were noted for glutamic acid, glycine, methionine, isoleucine, and leucine. Planting date effects were found only for glycine at the Los Lunas location and phenylalanine at both locations. Significant variety differences were found for methionine, tyrosine, phenylalanine, and lysine at the Arch location and for glycine, methionine, phenylalanine, and lysine at the Los Lunas location. A significant year effect, although small, was noted for about half of the amino acids (aspartic acid, serine, glutamic acid, proline, glycine, tyrosine, phenylalanine, arginine, and the sum of all amino acids) studied at the Arch location. Data at Los Lunas were observed only during the second year. The amino acid content agrees closely with that previously reported for other types of peanuts except for a 100% higher level of cystine found in this study. AA

- 742 WHITAKER (TB) and DICKENS (JW). Errors in aflatoxin analyses of raw peanuts by thin layer chromatography. Peanut Sci. 8(2); 1981; 89-92

- 743 HOOVER (MW) and NATHAN (PJ). Influence of tertiary butylhydroquinone and certain other surface coatings on the formation of carbonyl compounds in granulated roasted peanuts. J. Food Sci. 47(1); 1982; 246-8

Granulated roasted peanuts coated with combinations of 0.01, 0.02 and 0.03% tertiary butylhydroquinone (TBHQ) antioxidant, two fats and an acetylated monoglyceride were stored for 15 months and total carbonyls were measured monthly as index of oxidative rancidity. Carbonyl production was inhibited effectively by TBHQ combined with citric acid, while fats and monoglyceride coatings alone had no significant effect. Without TBHQ, there was a 5-fold increase in total carbonyl content. During the 15-month storage period, the total carbonyls increased by 20% in TBHQ (0.02%) treated peanuts, while it increased by 110% in peanuts without TBHQ. MVG

- 744 SANDERS (TH), SMITH (JS) Jr., LANSDEN (JA) and DAVIDSON (JI). Peanut quality changes associated with deficient warehouse storage. Peanut Sci. 8(2); 1981; 121-4

SOYABEAN

- 745 HSIEH (OA-L), HUANG (AS) and CHANG (SS). Isolation and identification of objectionable volatile flavour compounds in defatted soyabean flour. J. Food Sci. 47(1); 1982; 16-8, 23

Volatile flavour volatiles, isolated by a specially designed apparatus, were fractionated by gas chromatography. The characteristic beany, grassy and green odour fractions were identified by infra red

and mass spectrometry. The compounds identified included nine alcohols, six aldehydes, nine ketones and 2-pentyl furan. It appeared, among these compounds, 2-pentyl furan and ethyl vinyl ketone were probably the key compounds responsible for beany and grassy odour. All the compounds were postulated as autoxidative decomposition products. The presence of these compounds, therefore, were suggested to be due to the incomplete removal of lipids in soy flour. MVG

- 746 PRATT (DE), DI PIETRO (C), PORTER (WL) and GIFFEE (JW). Phenolic antioxidants of soy protein hydrolysates.

J. Food Sci. 47(1); 1982; 24-25, 35

Three isoflavones, namely, genistein, daidzein and glycitein, which were found in raw soyabeans, were also isolated from soy protein hydrolysates (SPH). However, no isoflavone glycosides were found in SPH. Caffeic, ferulic, p-coumaric, syringic, vanillic, gentisic and p-hydroxybenzoic acids were the phenolic acids found in SPH. These compounds were identified by TLC, GLC and UV and was confirmed by mass spectra. MVG

- 747 MORI (T), NAKAMURA (T) and UTSUMI (S). Gelation mechanism of soyabean 11 S globulin: Formation of soluble aggregates as transient intermediates.

J. Food Sci. 47(1); 1982; 26-30

The thermal association-dissociation behaviour of 11 S globulin which was found to be homogeneous by ultracentrifugal and gel electrophoretic analysis was investigated at early stages of heat induced gelling process at both 0.5 and 5% protein concentrates. The scheme proposed as a result of this study was: (a) soluble aggregates are formed when 11 S globulin is heated both at low and high concentration, (b) the soluble aggregate, on subsequent heating, disaggregates to acidic and basic subunits in low protein concentration while it undergoes disassociation at high protein concentration resulting in gel formation. The soluble aggregates, therefore, appeared to be transient intermediates in the course of gel formation of 11 S globulin. MVG

- 748 SASAKI (R), OKUMURA (K), KITABATAKE (N), KITABATAKE (N) and CHIBA (H). Changes of aldehyde levels in defatted soyabean extract.

J. Food Sci. 47(1); 1982; 31-5

The study concerns the dependency of aldehyde levels on the conditions for protein extraction. As measured by using aldehyde dehydrogenase, the aldehyde levels during 1:5 flour; water extraction at pH 6.5 and 1:20 flour: water extraction at pH 7.5, were found to increase markedly on incubation. However, during 1:5 flour:water extraction at pH 7.5, the aldehyde levels showed a marked decrease which could not be reversed by dilution treatment of the flour-water suspension before preparation of supernatant. It was, therefore, considered possible to prepare a soyabean extract with less aldehyde and a high yield of extracted protein. This also suggested that in a defatted soy flour suspension, there was some aldehyde-eliminating activities which was dependent on pH and flour concentration. In centrifuged extract, this activity was found to increase on incubation at pH 6.5, but when pH was adjusted to 7.5, 8.5 and 9.3 with NaOH, the aldehyde level decreased to 10-30% of the initial levels after incubation for 5 hours at 25 C. Incubation of the extract at pH 6.5 in the presence of 100 mM NaCl did not affect the increase of aldehyde. MVG

- 749 YEH (SW), WEI (LS) NELSON (AI) and STEINBERG (MP). Freeze-thaw stability of Illinois soyabean beverage.

J. Food Sci. 47(1); 1982; 299-302

- 750 CHEN (AH), McINTIRE (DD) and ALLEN (RR). Modeling of reaction rate constants and selectivities in soyabean oil hydrogenation.

J. Am. Oil Chem. Soc. 58(8); 1981; 816-8

- 751 RYDHAG (L) and WILTON (I). The function of phospholipids of soyabean lecithin in emulsions.
J. Am. Oil Chem. Soc. 58(8); 1981; 830-37

COTTONSEED

- 752 ZIEGLER (GM) Jr., KADAN (RS), FREEMAN (DW) and SPADARO (JJ). A direct hexane extraction process for glanded cottonseed.
J. Food Sci. 47(1); 1982; 314-6

- 753 GAD (TE) and EL-ZALAKI (EM). Effect of sodium hydroxide and other salts on Gossypol content of cottonseed meal and oil.
Fette Seifen Anstrichm. 82(10); 1980; 407-11

Different volumes of sodium hydroxide solutions of various concentrations when added to cottonseed meals before cooking greatly reduced the free gossypol content and the total gossypol of meals and oils by 28.3 to 92.9 and 17.9 to 100% respectively. The extent of reduction depends mainly on the volume of the alkaline solution rather than on its concentration. Cooking cottonseed meals with 1.85% calcium hydroxide and 0.5% ferrous sulphate solutions reduced the gossypol content of the crude oil by 91%. The oil had colour of 9 red units and free fatty acid content of 0.59%. The crude protein content of the meals was decreased by 6 to 7%. AA

SUNFLOWER

- 754 VACCARI (A), PIFFERI (PG) and ZACCHERINI (G). Anthocyanins of sunflower (*Helianthus annuus*).
J. Food Sci. 47(1); 1982; 40-42

The two major anthocyanin pigments were identified as Pn-3-divanillylsambubioside and Cy-3-vanillylsambubioside. Two more pigments were present in smaller quantities and identified tentatively. Chromatographic analysis showed five other pigments which were present in traces. MVG

MUSTARD

- 755 UNTERHALT (B). Turmeric and its application in mustard.
Z. Lebensmittel-Unters. Forsch. 170(6); 1980; 425-8 (German)
An attempt has been made to determine turmeric in mustard quantitatively. Curcumin and bis-demethoxycurcumin are measured by ^1H - and ^{13}C -nmr spectroscopy. The samples contained atmost 0.6 g turmeric/100 g of mustard. KMD

RAPESEED

- 756 TKACHUK (R). Oil and protein analysis of whole rapeseed kernels by near infrared reflectance spectroscopy.
J. Am. Oil Chem. Soc. 58(8); 1981; 819-22
- 757 THOMKE (S). Review of rapeseed meal in animal nutrition: Ruminant animals.
J. Am. Oil Chem. Soc. 58(8); 1981; 805-10

MACADAMIA NUTS

- 758 ANON. Macadamia nuts.
Gordian. 80(10); 1980; 244-5 (German)
A technical note detailing the current plans for production of macadamia nuts, their chemical composition, and export specifications for raw nut kernels. KMD

TUBERS AND VEGETABLES

- 759 SONTAG (G), SCHAFERS (FI) and HERRMANN (K). Determination of methylcaffeate and ethylcaffeate in vegetables by high pressure liquid chromatography with electrochemical detection.
Z. Lebensmittel-Unters. Forsch.

A method was developed for quantitative determination of methylcaffeate and ethylcaffeate. After extraction and preliminary purification on polyamide columns, the extracts were analysed by high pressure liquid chromatography, employing isocratic elution from nucleosil 10Cg. For identification and quantitative determination, an electrochemical detector was used. The detection limit of methyl caffeate is 0.02 ppm and for ethyl caffeate it is 0.025 ppm. Selected ion monitoring mass spectrometry was applied for confirmatory identification of these compounds. AA

- 760 FABOYA (OOP). The fatty acid composition of some tubers grown in Nigeria.
Food Chem. 7(2); 1981; 151-4

The fat content of some common tubers grown in Nigeria was determined and the distribution of fatty acids in them was measured by gas-liquid chromatography (GLC). The fat content was low (< 1-2%) in all species but the peel contained more fat than the pulp. Oleic acid (35-68%) and palmitic acid (21-39%) were the principal fatty acids, but arichidic acid was present in small amounts (< 3%) in all samples. The other fatty acids were present only in minor quantities, except for the higher levels in the peel. AA

- 761 LONGE (OG). Effect of boiling on the carbohydrate constituents of some non-leafy vegetables.
Food Chem. 7(1); 1981; 1-6

Losses which occur in the carbohydrate constituents of three non-leafy vegetables - onion (*Allium cepa*, L.), okra (*Hibiscus esculentus*, and eggplant (*Solanum incanum*, L.) - when boiled have been determined. Ethanol-soluble sugars, which comprised glucose, fructose and sucrose, and oligosaccharides in the raw samples ranged from 4.9% in okra to 54.9% in onion but were reduced to 0.5% and 8.9% on boiling. Starch content was 2.6% and 9.5% in raw okra and eggplant; respectively but corresponding values in processed samples were 1.3% and 8.6%. Losses in water-soluble polysaccharides ranged from 72.4% and 78.2% in okra and eggplant, respectively to 92.4% in onion. Hemicellulose values of 8.2%, 6.6% and 8.6% for okra, eggplant and onion reduced to 4.5%, 6.2% and 6.7%, respectively on boiling while losses obtained for cellulose were 9% - 14.1%. For lignin, there was an increase of 2% to 6.2%. AA

BEET

- 762 WELLER (TA) and LASURE (LL). Betalains in beet root tissue culture.
J. Food Sci. 47(1); 1982; 162-3

The goals of this study were to culture red beet cells via plant tissue culture techniques and to compare the pigment levels produced in callus culture with pigment levels of natural beet root. A modified Murashige and Skoog medium was used to maintain red, yellow and nonpigmented cell lines. It was found that the red pigment, betanin, content of the red cell line has to be increased 2-6 times to match levels found in natural beet root. AA

- 763 SHIH (CC) and WILEY (RC). Betacyanine and betaxanthine decolourizing enzymes in the beet (*Beta vulgaris* L.) root.
J. Food Sci. 47(1); 1982; 164-6, 172

Decolouring activities towards betaxanthine and betacyanines was inhibited by crude enzyme extrats from beet root sub cellular tissues. The optimum pH for the degradation was 3.4. The activities of enzyme

extracts varied with the cultivars. The major portion of this activity was found in epidermal tissue when most pigments were accumulated. Effects to solubilise the tissue bound enzyme using sodium chloride, cellulase and pectinase, met with little success; however, it was found, NaCl had inhibitory effect on the betacyanine discolourising enzyme. Several commercial enzyme preparations also had betacyanine decolourising activity. MVG

POTATO

- 764 WOLF (F), MALLON (H-J) and GERLACH (H). Efficiency of different metal salt initiators on graft polymerization of acrylonitrile on potato starch. Starch. 32(7); 1980; 229-31 (German)

- 765 BERGHOFER (E), MITTELBACH (F), STEYRER (W) and KLAUSHOFER (H). Enzymatic hydrolysis of heat coagulated potato protein. Starch. 32(7); 1980; 231-8 (German)

Deals with the possibilities of improving functional properties of heat coagulated potato protein by treatment with proteolytic enzymes, as compared to proteins of plant and animal origin. AA

- 766 MEUSER (F), KOHLER (F), MOHR (G) and STEYRER (W). Improved nutritive value of extrusion cooked corn grits by protein enrichment with potato protein coagulate. Starch. 32(7); 1980; 238-43

The nutritive value of extrusion cooked corn grits is improved by using potato protein coagulate or soy protein concentrate. Complementary value of potato protein to corn protein is higher than that of soy protein concentrate. The products are of acceptable quality. Due to dissipation of energy during extrusion cooking, the enzyme susceptibility of starch and protein are increased and trypsin inhibitors are largely inactivated. The effect of extrusion on the protein quality, starch digestibility and inactivation of trypsin inhibitions is discussed. KMD

- 767 WOJNOWSKA (I), POZNANSKI (S) and BEDNARSKI (W). Processing of potato protein concentrates and their properties. J. Food Sci. 47(1); 1982; 167-72

Ultra filtration (UF), polyelectrolyte - coagulation (PC) and cryoconcentration (CC) were compared for protein recovery from potato juice. UF gave the best yield. Foaming and emulsifying properties, wettability, swelling and buffer capacities of the potato protein differed depending on the method of recovery. The dried proteins had a high level of proteolytic enzyme inhibitors and glucoalkaloids. Thermal inactivation before drying resulted in destruction of protease inhibitors (43-48%) and glucoalkaloids (81-89%). However, thermal treatment resulted in distinct changes in amino acid composition and had an adverse effect on the properties of the dried protein. MVG

- 768 McLAIN (HD) and McKAY (G). The mode of hydraulic transportation of potato chips in horizontal pipelines. Ir. J. Food Sci. Technol. 5(2); 1981; 143-8

The transportation behaviour of uncooked potato chips in horizontal pipelines of diameters 95 and 152 mm has been investigated. The variables investigated included the pressure gradient along the pipe, the flow velocity and the delivered potato chip concentration. The effect of flow velocity on the mode of transportation was observed. The pressure gradient along the pipe was shown to be given by an equation of the form:

$$\frac{i - i_w}{C} = x \left[\frac{V_m}{\sqrt{g D_t (s-l)}} \right] - y$$

where the constants x and y have been determined for the two pipe sizes.

At low velocity the mode of transport was observed to be by the potato chips sliding along the bottom of the pipe. As the flow velocity was increased saltation occurred at the surface of the sliding bed. At still higher velocities the potato chips were transported as a heterogeneous suspension maintained by turbulence. AA

- 769 GATFIELD (IAN L) and STUTE (R). Studies on the non-coagulable nitrogenous material present in potato juice. Presence of peptides and glycopeptides.

Z. Lebensmittel-Unters. Forsch. 170(6); 1980; 429-32

Experimental evidence is presented which suggests that the noncoagulable nitrogenous material present in potato juice contains both peptides and glycopeptides in addition to the amino acids and amides known to be present. Preliminary characterisation of the polypeptide material indicates two fractions with molecular weights in the 3000-, 6000 and 25000 dalton range. AA

TOMATO

- 770 THOMAS (RL), JEN (JJ) and MORR (CV). Changes in soluble and bound peroxidase-IAA oxidase during tomato fruit development. J. Food Sci. 47(1); 1982; 158-61

SWEET PEPPER

- 771 TONELLI (D), GATTAVECCHIA (E) and BUDINI (R). Biochemical changes in green sweet peppers during storage at different temperatures. Food Chem. 7(3); 1981; 189-93

The effect of temperature on the levels of moisture, ascorbic acid, proteins and phenolic compounds in green sweet peppers (cvs. Sumo and Quadrato d'Asti) was investigated after seven days' storage at a relative humidity of 85-90%. Chemical composition did not differ appreciably after storage at 10 C, whereas changes were found after storage at 20 C and 30 C. Therefore, 10 C was the most favourable storage temperature for peppers although, at 20 C, retention of quality was adequate in terms of texture and appearance. AA

SUMMER SQUASH

- 772 HURST (WC), SCHULER (GA), REAGAN (JO) and RAO (VNM). Effect of harvest data, irrigation, maturity and calcium addition during processing on quality of canned summer squash. J. Food Sci. 47(1); 1982; 306-10

FRUITS

- 773 PAZ (O), JANES (HW), PREVOST (BA) and FRENKEL (C). Enhancement of fruit sensory quality by post-harvest applications of acetaldehyde and ethanol. J. Food Sci. 47(1); 1982; 270-73, 276

Post-harvest application of acetaldehyde vapours to blueberries, tomatoes, and pears led to the enhancement of the fruit sensory quality including an increase in the sugar content, sugar-acid ratio, and flavour changes judged to be acceptable by test panels. Applied ethanol vapours led to similar but limited enhancement of fruit sensory quality. Comparative applications of ethylene were more effective in stimulating changes in the background colour, including an increase in the total carotenoid content in tomato and anthocyanines in blueberry. Ethylene, however, had little or no effect, and occasionally led to deleterious changes in the fruit sensory quality. Acetaldehyde and related volati-

les may be important in the development of fruit sensory quality, as occurring normally during ripening, or as a post-harvest application for the improvement of fruit sensory quality. AA

BANANA

- 774 SUGIMOTO (Y), FUJITA (S), TAKAYA (T) and FUWA (H). *In vivo* digestion of banana starch granules. Starch. 32(9); 1980; 290-4

This paper describes the extent and the mode of *in vivo* digestion of banana, potato and normal maize starch granules by rats. The *in vivo* digestibility values of specific starch granules may depend on species, strains, and age of the experimental animals, duration of feeding and composition of the experimental diets, especially contents of starch granules and protein. However, many studies on rats indicate that about or more than half (40-60%) of the ingested potato starch granules disappeared in the rat bodies. The enlargement of the small intestine of rats fed either banana or potato starch diets was due to hyperplasia and that of the cecum was probably due to hyperplasia with hypertrophy, using the ratios of protein to DNA of the organs as an index. KMD

MANGO

- 775 PASSERA (C) and SPETTOLI (P). Effects of benzylaminopurine on mango fruit ripening. Food Chem. 7(3); 1981; 195-201

The total and reducing sugars, organic acid and free amino acid contents of the edible portions of mango (cv. *Boribo*) were determined in unripe and ripe fruits, both treated and untreated with benzylaminopurine (BA). Total and reducing sugar contents were increased and organic acids and free amino acid contents were decreased after ripening in both cases. Benzylaminopurine delayed ripening and the composition of the ripe fruit was different from that of the untreated control. AA

SWEET CHERRY

- 776 CORNWELL (CJ), WROLSTAD (RE) and REYES (FGR). Effect of sucrose addition on the sugar and sorbitol composition of frozen sweet cherries and their derived concentrates. J. Food Sci. 47(1); 1982; 281-3, 290

- 777 HENNING (W) and HERRMANN (K). Flavonol glycosides of sweet cherries (*Prunus avium*, L.) and sour cherries (*Prunus cerasus*, L.). II. Phenolics of fruits.

Z. Lebensmittel-Unters. Forsch. 170(6); 1980; 433-44 (German)

Leaves and fruits of sweet and sour cherries (7 cultivars) examined by the authors contained exclusively glycosides of kaempferol and quercetin, which have been isolated, in part, in crystalline form. The total flavonolglycoside contents of leaves were 2850-8400 ppm and of fruits 10-60 ppm on a fresh weight basis. As major glycosides, the authors found the 3-glycosides and 3-rutinosides. 3-Galactosides and queraetin 3-rhamnoside are minor glycosides as well as several tri- and tetraglycosides. Three tetraglycosides could be identified. In addition, 3,4'-bisglucosides of kaempferol and quercetin were isolated from sweet cherries. A high-pressure liquid chromatographic method is described for the rapid quantitative determination of flavonol glycosides. All 7 cultivars were examined by this method. AA

PEACH

- 778 LIN (RR) and RAO (VNM). Sensory, physical and chemical properties of canned peaches.
J. Food Sci. 47(1); 1982; 317-8, 321

APPLE

- 779 GORMLEY (TR), HARRINGTON (D) and McDONNELL (PF). Quality of Golden Delicious apples grown in seven different orchard locations.
Ir. J. Food Sci. Technol. 5(2); 1981; 165-9
Tests were carried out on the quality and yield potential of Golden Delicious apples grown in seven different orchard locations in Ireland over five seasons. No significant differences were obtained for fruit from the different sites in terms of soluble solids and acid contents, fruit colour, firmness and fruit weight. Cumulative yield values were different ($p < 0.05$) for the locations ranging from 37 to 56 kg/tree. Correlation coefficients between yield and soluble solids and between yield and colour were all negative and varied considerably from season to season. AA
- 780 O'BEIRNE (D), VAN BUREN (JP) and MATTICK (LM). Two distinct pectin fractions from senescent Idared apples extracted using nondegradative methods.
J. Food Sci. 47(1); 1982; 173-6
After removal of water-soluble pectin from senescent Idared apples, an additional sizable pectin fraction could be extracted using Na_2FDTA under nondegradative conditions. This chelator-soluble fraction did not appear to own its insolubility in the cell wall solely to molecular charge. The galacturonic acid-rich polymers of chelator-soluble pectin were notably lower in arabinose galactose and rhamnose residues than those of water-soluble pectin. AA
- 781 SMITH (DA), DOZIER (WA), GRIFFEY (WA) and RYMAL (KS). Effect of steam temperature, speed of cooling and cutin disruption in steam and lye peeling of apples.
J. Food Sci. 47(1); 1982; 267-9
A laboratory model steam peeler was adapted to accept superheated steam and direct injection of cold water in order to study the effect of rapid heating with superheated steam and rapid cooling under partial vacuum on the peeling efficiency of 'Red Delicious' apples. A test was also designed to determine the effect of physical disruption of the cutin layer on the efficiency of caustic peeling. Steam peeling resulted in higher peeled yields and brighter product colour than caustic peeling. The peeled yields were 97.5% for superheated steam-peeled apples with flash cooling, 91.7% for caustic peeled fruit which had a prepeel treatment to physically disrupt the cutin layer, 85.8% for conventionally caustic-peeled fruit, and 82.7% for the mechanically peeled control. AA

SUGAR, STARCH AND CONFECTIONERY

- 782 YAMAUCHI (F). Relation between carbohydrates and proteins in foods.
J. Jpn. Soc. Starch Sci. 28(1); 1981; 33-40 (Japanese)
There are three typical relations between carbohydrates and proteins.
1) Starch and proteins, such as wheat starch and gluten in dough for bread making and fish meat and starch in *Kamaboko*, where their viscosity and elasticity are strengthened by each other. 2) Proteins and ionic carbohydrate polymers, such as whey proteins and carboxymethyl-cellose and gluten and microbial polysaccharides, where the proteins are aggregated and precipitated in a dilute solution. 3) Proteins and oligo-saccharides, such as sucrose and *Surimi* (fish meat jelly) and egg pro-

teins, where the proteins are protected by oligosaccharides against the denaturation of freezing, heating or acidic conditions. These relations in food processing and fundamental studies are reviewed and summarized.
AA

- 783 KEARSLEY (MW), BIRCH (GG), TABIRI (JN) and DUDBRIDGE (MJ). The production and properties of glucose syrups. II. Physiological properties of glucose syrups.
Starch. 32(6); 1980; 205-9
The study indicates that when gum arabic, fat and protein are taken in conjunction with glucose syrup, changes in blood glucose profiles occur as compared with glucose syrup alone. With gum arabic, the effect is greatest in the 21% D.E. syrup, 30 minutes post ingestion (causing an increase of blood glucose) and thereafter the effect is confined to the higher D.E. syrups. Added protein produces an elevated blood glucose peak and while added fat causes decreased peak. Smaller loadings (10 g instead of 50 g) of different D.E. syrups showed no significant differences in blood glucose profiles. AA
- 784 KEARSLEY (MW), DZIEDZIC (SZ), BIRCH (GG) and SMITH (PD). The production and properties of glucose syrups. III. Sweetness of glucose syrups and related carbohydrates.
Starch. 32(7); 1980; 244-7
A series of glucose syrups, before and after hydrogenation, were assessed for sweetness at concentrations of 10% and 20%. Only in the cases of 21% D.E. glucose syrup and D. glucose, there was no significant increase in sweetness at 10% after hydrogenation and at 20% only with D. glucose. These results contrast with a previous report. Hydrogenation of mono and disaccharides except D. glucose and cellobiose, resulted in increased sweetness. Various theories are proposed to explain the results. AA
- 785 DONOVAN (JW) and MAPES (CJ). Multiple phase transitions of starches and Nageli amyloextrins.
Starch. 32(6); 1980; 190-3
- 786 HANDA (T), YAJIMA (H), YAMAMURA (T), ISHII (T) and AIKAWA (H). Enthalpy change of amylose triiodide complex formation.
Starch. 32(6); 1980; 194-7
- 787 BOYER (CD), DAMEWOOD (PA) and MATTERS (GL). Effect of gene dosage at high amylose loci on the properties of the amylopectin fractions of the starches.
Starch. 32(7); 1980; 217-22
- 788 WATANABE (Y), HANAOKA (A), MORIKAWA (Y), OHTA (F) and AYANO (Y). Digestive process of amylo maize starch granules in the digestive tract of rats.
J. Jpn. Soc. Starch Sci. 28(1); 1981; 9-15 (Japanese)
In order to clarify the mechanism of digestion of amylo maize starch granules by rats, some properties of the starch remaining in the digestive tract and the activities of starch-degrading enzyme in the intestine were examined by using the animals fed on the starch granules (amylose content 19.3%). The starch granules were isolated from stomach, small intestine, cecum, large intestine and feces at various intervals after feeding. The elution patterns of the starches on a Sephadex G-50 column showed that low molecular weight components accumulated and increased gradually with progress of digestion. The iodine colouration of the starches decreased, and the $\lambda_{\max}$ of the starch-iodine complex shifted to a shorter wavelength during the same process. These findings as well as of the previous studies suggest that the amorphous parts of amylo maize starch granules were preferentially degraded in the rat intestine, and the crystalline parts in the granules accumulated in the residual starch. The amylase activities in the intestine of rats fed on amylo maize starch granules were detected not only in the small

intestine but in the cecum and large intestine, whereas the amylase activities in the intestine of the animals fed on normal corn starch were present mostly in the small intestine. It seems that amylo maize starch granules were digested through the whole intestine. The digestive capacity for amylo maize starch granules of the cecum contents tended to be larger than that of the small intestine contents, as compared on the same basis of amylase activity. These results suggest that the starch-degrading enzyme systems are different in these organs. AA

- 789 RAFFI (J), MICHEL (JP) and SAINT-LEBE (L). Theoretical study of the radiodepolymerization of starch.
Starch. 32(7); 1980; 227-9

A theoretical study of the depolymerization of starch under the action of gamma radiation is proposed; it allows prediction of the variations of the average degree of polymerization and the mass of water soluble products of the sample as a function of parameters of the treatment and the characteristics of the starch. AA

- 790 TAKAHASHI (K), SHIRAI (K) and WADA (K). Relation between the gelatinization and the retained salt of starch.
J. Jpn. Soc. Starch. Sci. 28(1); 1981; 1-8 (Japanese)

In the present investigations, the authors studied the effect of salt retained by starch granule in neutral salt solutions; Na_2SO_4 , NaCl and NaBr solutions on the gelatinization of starch. The following findings were obtained: The content of water retained by starch granule in Na_2SO_4 solution, was smaller than the control (in water), while the retained water content in NaCl solution indicated a similar level, and an increased level in NaBr solution. The content of salt retained by starch granule was relatively low in Na_2SO_4 solution, while considerably high in NaCl and NaBr solutions. 2. The retained Na_2SO_4 brought about a GT rise from 62 C to 80 C, while the retained NaCl or NaBr decreased the GT of the starch from 62 C to 56 C or 41 C respectively. Although the retained Na_2SO_4 did not affect essentially the endothermic heat of gelatinization, the retained NaCl and NaBr decreased it to about 70% and 50% of the control, respectively. Such decreases were accompanied by the corresponding decreases of the sharpness of X-ray diffraction. 3. The polarization pattern of Na_2SO_4 treated starch granule still retained a part of original pattern at ceased point of DTA-endotherm, while NaBr-treated starch granule had lost a part of original polarization pattern already before heating by DTA. From these observations, it is suggested that the salt retained by starch granule affects the structural stability of starch micelle. AA

- 791 NARA (S). On the water sorption in starch granules.
J. Jpn. Soc. Starch. Sci. 28(1); 1981; 24-32 (Japanese)

The values of the monolayer sorption water in starch were 7-8% of starch and saturated sorption water would be six molecules for each glucose residue and the crystallinity of starch were found to be from 31 to 45% by means of moisture regain method. The crystallinity measured by means of X-ray method increased with increasing sorption water and seemed to become the values by means of the moisture regain and specific-volume methods. The heat of crystallization of starch were as follows: 0.4-0.5 kcal (molecular glucose residue)⁻¹ for potato, sweet potato and tapioca starches, and 1.9-2.2 kcal (molecular glucose residue)⁻¹ for corn and wheat starches. The amorphous portion in sweet potato and tapioca starches were 1.2 times as much as that of wheat and corn starches according to the results as to integral net sorption heat. AA

- 792 SWEETMAKER. Starch jellies.
Confect. Prod. 47(7); 1981; 346-7

CONFECTIONERY

- 793 FOX (H). New confectionery packaging in the USA "Generics".
Confect. Prod. 47(7); 1981; 344-5

- 794 BOLEY (NP), CROSBY (NT), ROPER (P) and SOMERS (L). Determining of indigo carmine in boiled sweets and similar confectionery products. Analyst. 106(1263); 1981; 710-13
Reports a HPLC method, wherein the rapid extraction and concentration of Indigo carmine and other synthetic colours present is achieved by use of the SEP-PAKC₁₈ sample preparation cartridge. Short analysis time and mild conditions of extraction employed ensure maximum recovery of extracted colour. BSN

CHOCOLATE

- 795 STEINBERG (G). Flowband dragee plant for the economical production of chocolate dragees. Conf. Prod. 47(7); 1981; 329-32

BAKERY PRODUCTS

- 796 KASPER (DJ). Troubleshooting at the bakery level. Cereal Food World. 26(8); 1981; 390-93

BREAD

- 797 ANON. Bread today. Food Process. Ind. 50(593); 1981; 30-31
- 798 RUBENTHALER (GL) and FARIDI (HA). Laboratory dough molder for flat breads. Cereal Chem. 59(1); 1982; 72-3
Because a major factor influencing the quality of Middle-Eastern style flat breads baked is the thickness to which the dough is rolled in preparation for baking, a molder was designed and constructed to minimize this factor in laboratory testing. The molder is adjustable from 0 to 12 mm, in increments of 0.01 mm, and therefore is usable in preparing doughs for all flat breads. AA
- 799 UNKLESBAY (N), UNKLESBAY (K), NAHAISI (M) and KRAUSE (G). Thermal conductivity of white bread during convective heat processing. J. Food Sci. 47(1); 1982; 249-53, 259
- 800 REPETSKY (JA) and KLEIN (BP). Partial replacement of wheat flour with yellow field pea flour in white pan bread. J. Food Sci. 47(1); 1982; 326-7, 329
Yellow field pea flour replaced 2.5, 5 and 10% of wheat flour in white pan bread prepared by a straight dough, rapid mix home formulation. Incorporation of pea flour did not affect proofing times. No significant differences were found between Gardner L and "a" values for wheat-pea flour blends, but "b" values increased with increasing levels of pea flour; crumb colour of breads did not differ significantly. Volumes of the breads were not significantly affected by pea flour addition. Pea flour breads were judged between fair and good for all characteristics by an experienced taste panel; the 10% pea flour breads were scored significantly lower for texture, colour and flavour. AA

BISCUIT

- 801 WRIGHT (I). Biscuit manufacture: Less waste and more speed. Food Flavour. Ingred. Packag. 3(11); 1981; 33, 35

CRACKER

- 802 FIELDS (ML), HOSENEY (RC) and VARRIANO-MARSTON (E). Microbiology of cracker sponge fermentation. Cereal Chem. 59(1); 1981; 23-6

SPAGHETTI

- 803 MOLINA (MR), GUDIEL (H), BATEN (MA) and BRESSANI (R). Production of high-protein quality pasta products using a semolina/corn/soy flour mixture. III. Effect of cooking on the protein nutritive value of pasta. Cereal Chem. 59(1); 1982; 34-7

Pasta products were prepared from semolina and from semolina replaced at the 20, 40, 60, and 75% levels by whole corn flour processed in a double drum dried at 143 C surface temperature. From these mixtures, spaghetti was prepared with and without either 0.3% L-lysine or 8% defatted soy flour. A test of resistance to disintegration and organoleptic evaluation indicated that quality decreased significantly ($P < 0.05$) when the semolina in the blend was lower than 40 and 32%, respectively. A significant ($P < 0.05$) correlation ($r = -0.93$) was found between solids lost through cooking and organoleptic evaluation score. After cooking, all products showed increased nitrogen content. Cooking decreased significantly ($P < 0.05$) the total and available lysine and the protein quality of the L-lysine-supplemented products, but it caused an increase in the percentage of available lysine in the soy-supplemented and unsupplemented products and therefore improved the protein nutritive value. A significant ($P < 0.01$) positive correlation ($r = 0.98$) was found between the available lysine content and the protein nutritive value of the products. AA

MILK AND DAIRY PRODUCTS

- 804 ABECASSIS (G), LELEU (R) and CIBOIT (J). Evaporation with mechanical recompression of waste water in the dairy industry. Ind. Alim. Agric. 97(9); 1980; 875-89 (French)

After having summarized the principle of evaporation with mechanical recompression, the authors describe the specific characteristics of this technique with different types of compressors and evaporators. Conditions entailed in associating compressors and evaporators have been studied. Practical advice for the adaptation of mechanical recompression and the elements required to calculate the savings achieved with regard to running and fuel costs by means of this technique have been reported. AA

- 805 HEGARTY (PVJ). Some practical consideration in the nutritional evaluation of the mineral content of dairy products. Ir. J. Food Sci. Technol. 5(2); 1981; 157-63

MILK

- 806 GRAPPIN (R), PACKARD (VS) and GINN (RE). Variability and inter-relationship of various herd milk components. J. Food Prot. 44(1); 1981; 69-72

Fat was found to be the most variable component in milk, followed in descending order by protein, total solids, lactose, and solids non-fat (SNF). Non-protein-nitrogen (NPN) levels averaged 4.36% of total nitrogen. Coefficient of variation of NPN was 15.18. Thus, NPN represents a significant factor in protein analysis, where the Kjeldahl procedure is used as a reference standard. If purchase price of milk is to be based on protein content, then it is desirable to take the "true protein" value (total N - NPN) rather than the total N value as the basis. KMD

- 807 MORRISSEY (PA), MURPHY (MF), HEARN (CM) and FOX (PF). Composition and stability of mid-lactation milks. Ir. J. Food Sci. Technol. 5(2); 1981; 117-27
- 808 FOX (PF). Heat-induced changes in milk preceding coagulation. J. Dairy Sci. 64(11); 1981; 2127-37
Principal changes induced in milk on heating at elevated temperatures (~ 140 C) for extended periods is reviewed in the context of the contribution of these changes to heat coagulation of milk. AA
- 809 McKELLAR (RC). Development of off-flavours in ultra-high temperature and pasteurised milk as a function of proteolysis. J. Dairy Sci. 64(11); 1981; 2138-45
- 810 SHIPE (WE) and SENYK (GF). Effects of processing conditions on lipolysis in milk. J. Dairy Sci. 64(11); 1981; 2146-9
Lipolysis, as measured by acid degree value, was observed in processed milk samples. Temperature of pasteurization was a key factor in control of lipase activity. Minimum legal pasteurization was not adequate to prevent lipolysis completely in samples stored for 7 days at 5 C. However, in most cases heating to 76.7 C for 16 seconds did prevent lipolysis from reaching sensory threshold. Varying the holding times from 16 to 24 seconds did not affect lipolysis when temperature was 74.4 C or higher. Varying homogenization pressures from 105 to 211 kg/cm² did not alter lipolysis significantly. Differences were noted between eight herd milks for extent of prepasteurization lipolysis and thermal inactivation of lipases in these samples. AA
- 811 JAYNES (HO), PEARSALL (MG) and HOLT (HC). Field test for titratable acidity in milk. J. Dairy Sci. 64(11); 1981; 2150-53
- 812 CLEMENS (RA). Effects of storage on the bioavailability and chemistry of iron powders in a heat-processed liquid milk-based product. J. Food Sci. 47(1); 1982; 228-30
Relative Biological Value (RBV) was determined by hemoglobin repletion after 6 and 12 m storage of a canned milk-based product which contained 25% U.S. RDA for iron from either ferric orthophosphate (FOP), electrolytic iron (EI), or carbonyl iron (CI). RBV's for the two elemental iron sources were comparable to the RBV of ferrous sulphate and were significantly greater ($P < 0.01$) than the RBV for FOP after each storage period. Significant differences in RBV's for a given iron source were not observed between the two storage periods. A markedly greater percentage of iron from CI and EI than from FOP was solubilized and found in the ferrous form. AA
- 813 FRANKE (AA), DUNKLEY (WL) and SMITH (NE). Influence of dairy rations with whole cottonseed or extruded soyabeans on accuracy of analysis for milk components. J. Dairy Sci. 64(11); 1981; 2185-91
- 814 ILOEJE (MU), VAN VLECK (LD) and WIGGANS (GR). Components of variance for milk and fat yields in dairy goats. J. Dairy Sci. 64(11); 1981; 2290-93
- 815 BLANC (M). Rapid method of estimation of aflatoxin M1 in dairy products. Ind. Alim. Agric. 97(9); 1980; 893-901 (French)
A quantitative, precise, sensitive, specific, and rapid method for the estimation of aflatoxin M1 has been developed by combining a technique for extraction of the solvent with a ternary solvent (chloroform, methanol/water) and estimation by high performance liquid chromatography (HPLC), with fluorometric detection in a cell filled with silica. When applied to various milk products - liquid milk, milk powder, lactoserum,

fresh cheeses, finished cheeses - this method gives better results than those currently in use. KMD

BUTTERMILK

- 816 WANG (JJ) and FRANK (JF). Characterization of psychrotrophic bacterial contamination in commercial buttermilk.
J. Dairy Sci. 64(11); 1981; 2154-60

WHEY

- 817 MULLER (LL). Physico-chemical separation processes for food wastes.
CSIRO Food Res. Q. 41(2); 1981; 37-43
Mostly deals with whey as a raw material, whole whey products, whey protein products and lactose products. KAR
- 818 LABUZA (TP) and SALTMARCH (M). Kinetics of browning and protein quality loss in whey powders during steady state and nonsteady state storage conditions.
J. Food Sci. 47(1); 1982; 92-6, 113
The study was concerned with the effect of both temperature and a_w on browning and protein quality loss in whey powders as well as to determine whether kinetic data from steady state storage conditions could be used to predict actual browning and protein quality losses occurring under fluctuating storage temperature conditions. Results indicated that temperature history does not change significantly the reaction mechanisms. MVG

YOGURT

- 819 DEETH (HC) and TAMIME (AY). Yogurt: Nutritive and therapeutic aspects.
J. Food Prot. 44(1); 1981; 78-86
This review deals with the nutritive value of yogurt in terms of its chemical composition, vitamin content and digestibility. The reported therapeutic benefits of yogurt for gastrointestinal disorders, coronary heart disease and other maladies are also discussed. AA

BUTTER

- 820 KAUL (A), JASJIT SINGH and KUILA (RK). Potassium sorbate as a preservative of butter.
J. Food Prot. 44(1); 1981; 33-4, 38
Potassium sorbate incorporated in butter at the 0.1% level inhibited mould growth for 5 weeks in all samples stored at -20 C, while in control samples stored at 37 C, coliform counts increased rapidly. Potassium sorbate also decreased the release of free fatty acids and thiobarbituric acid in the samples. KMD

CHEESE

- 821 BRESSAN (JA), CARROAD (PA), MERSON (RL) and DUNKLEY (WL). Modeling of isothermal diffusion of whey components from small curd cottage cheese during washing.
J. Food Sci. 47(3); 1982; 84-8
The heat transfer in a batch washing system is postulated to approximate an isothermal diffusion process (25 C) as in such a system, heat transfer is much more rapid than the diffusive mass transfer so that the curd reaches thermal equilibrium quickly. The two diffusing species considered in this study were total solids and lactose. It was shown that the diffusion from a spherical particle with consideration

of whey entrained in curd interstices by capillary forces is an acceptable basis for a mass transfer model. MVG

- 822 BRESSAN (JA) and CARROAD (PA). Heat transfer during the washing of small curd cottage cheese.
J. Food Sci. 47(4); 1982; 89-91
The heat transfer which occurs during the cooling of small curd cottage cheese during washing is mathematically modeled as a conduction process. The thermal diffusivity for curd was determined experimentally and shown to agree with predictions of correlations in the literature. Heat transfer occurs rapidly in curd, and is a relatively less significant design basis for washing systems than mass transfer. AA
- 823 TORRES (N) and CHANDAN (RC). Flavour and texture development in Latin American white cheese.
J. Dairy Sci. 64(11); 1981; 2161-9
- 824 HERNANDEZ (M), VEGA (A) and SOTELO (A). Nutritional evaluation of cereal-cheese whey mixtures.
J. Food Sci. 47(1); 1982; 81-3, 105
Dehydrated sweet cheese whey, wheat flour, wheat bran and lime-treated corn flour (used for making tortillas), and cereal-cheese whey mixtures (21 nos.) were evaluated for chemical composition, amino acid content, PER and digestibility. Results indicated that the nutritive value of all the above cereal products increased significantly with the addition of dehydrated cheese whey (15-25% or more by weight). MVG
- 825 ELLIOTT (JA), MILLARD (GE) and HOLLEY (RA). Late gas defect in cheddar cheese caused by an unusual bacterium.
J. Dairy Sci. 64(11); 1981; 2278-83

- 826 KIERMEIER (F) and KRAUS (P-V). On the possible presence of sterigmatocystin in milk and its behaviour in cheese.
Z. Lebensmittel-Unters. Forsch. 170(6); 1980; 421-4 (German)
The presence of sterigmatocystin (st) in many foods leads us to the assumption that it might be found in milk and milk products like, for instance aflatoxin M₁. Model experiments did not yield definite conclusions. However, the transfer into cheese curd seems possible, because 90%-99% of the St could be redetected there due to its higher water-insolubility and increased protein binding. VR

ICE CREAM

- 827 FLACK (EA). Ice cream and the EEC. A review of compositional requirements.
Food Flavour. Ingrid. Process. Packag. 3(11); 1981; 10-13
- 828 LEROUX (H) and CHARDON (F). Edible monoglycerides in ice-creams.
Ind. Alim. Agric. 97(9); 1980; 917-22 (French)
The monodiglycerides of food fatty acids can now be tested in the French industry of ices and icecreams. They ensure a better dispersion of fats in the mix and in the freezer avoiding the partial reagglomeration of fat globules; they set up a more stable structure than in a recipe without emulsifier. It is usual to associate monodiglycerides with hydrocolloids in presenting them under an integrated form, which makes the incorporation of these products in the mix easier. AA

MEAT AND POULTRY

- 829 PRIOR (R). A modern rendering technique.
Food Process. Ind. 50(596); 1981; 26-7, 29

- 830 ANON. Break through in lean/fat meat analysis. Food Process. Ind. 50(596); 1981; 29-30
- 831 MEIXNER. About the problems of continuous filling. Fleisch. 33(9); 1979; 167-8 (German)
- 832 GERSDORF (F), SCHMIDT (L), TORPE, KIESSLING (I) and RAEVBER (UJ). Possibilities of mechanical loading of cold smoke vaults and maturing rooms. Fleisch. 33(9); 1979; 171-3 (German)
- 833 KUNZ (B) and BLUMEL (W). Lyophilized lactic acid bacteria as starter culture for the meat industry. Fleisch. 33(9); 1979; 175-6 (German)
After describing the advantages of the application of freeze dried starter cultures, basic scientific aspects as related to the production of lyophilized lactic acid bacteria have been reported. KMD
- 834 SHIELDS (B). Automatic control of meat product recipes. Food Process. Ind. 50(596); 1981; 31, 34
- 835 OZIMEK (G) and POZNANSKI (S). Influence of an addition of textured milk proteins upon physicochemical properties of meat mixtures. J. Food Sci. 47(1); 1982; 234-9, 245
- 836 NAGEL (CW), BREKKE (CJ) and LEUNG (HK). Humectant analysis of intermediate moisture meat by high performance liquid chromatography. J. Food Sci. 47(1); 1982; 342-3
A quantitative extraction and high performance liquid chromatography (HPLC) procedure for analysis of four common humectants (sucrose, sorbitol, glycerol and propylene glycol) in intermediate moisture meat was developed. The procedure includes removal of ionic species from an extract with cation and anion columns prior to HPLC analysis with an Aminex HPX-87 column. The total time for HPLC analysis was 20 minutes. Total mean recovery of the humectants added to the meat ranged from 97% for sucrose to 110% for glycerol. AA
- 837 BARREL (RA) and WATKINSON (JM). The bacteriology of cooked meat. Environ. Health. 89(6); 1981; 148-51
- 838 GRAU (FH). Microbial ecology and interactions in chilled meat. CSIRO Food Res. Q. 41(1); 1981; 12-8
The effect of temperature, water activity, pH and soluble components on the growth of microorganisms in aerobically stored meat and the flora in vacuum-packed meat with high carbon dioxide and low oxygen content have also been discussed. KAR
- 839 NKANGA (EJ) and URAIH (N). Prevalence of *Staphylococcus aureus* in meat samples from traditional markets in Benin City, Nigeria, and possible control by use of condiments. J. Food Prot. 44(1); 1981; 4-8, 27
Tests were conducted weekly over a 6-month period to determine the contamination of meat samples from the traditional market, supermarket, and abattoir with coagulase-positive *Staphylococci*. The counts ranged from 10^4 - 10^{11} cells/g. The highest count was made in fresh pork (6.4×10^{10} /g), followed in decreasing order by dried beef (3.7×10^{10}), fresh goat and fried chicken (6.8×10^9 /g) and fresh beef (7.0×10^9 /g) samples from the traditional market. The counts in supermarket meat were: 4.5×10^5 /g in chilled beef; 3.0×10^5 /g in chilled pork, and 2.0×10^4 /g in frozen chicken. The abattoir meat had 3.5×10^4 cells/g. The effect of condiments, viz. cloves, onion, ginger, black pepper, and red pepper, on the bacterial count was also studied. Cloves were found to be the most active, with 1% (w.v) of the spice preventing outgrowth of *S. aureus* for up to 18 hours contact time. At 10% level, cloves were bactericidal, reducing the load from 2.9×10^3 /ml of homogenate at 0 hour

to 1.2×10^1 /ml after 18 hour contact time. All the other spices tested except ginger, were also bactericidal when used at 10% level for 18 hours, but to a lesser extent than cloves. Ginger, however, increased the bacterial load, and was even found to be contaminated with *S. aureus*. KMD

- 840 TERRELL (RN) and BROWN (JA). Salt, water and oilseed proteins affect brine content of sausages.

J. Food Prot. 44(1); 1981; 43-6, 54

Brine contents of commercial sausage products ranged from 3.7-5.9%. Frankfurters prepared with oilseed proteins had higher process shrinkage percentages, higher moisture percentages, and lower brine contents than the (all-meat) controls. At the beginning and end of a 6-week storage period, frankfurters with high brine contents (4.5 - 5.25%) had a lower microbial load than frankfurters with moderate (3.5 - 4.49%) or low (2.5 - 3.49%) brine contents. Because of simplicity, brine content determination may be preferred to a_w -determination for predicting product performance of cured sausages. KMD

- 841 ZWEIG (K) and SCHOSSIG (H). Experience with the steam smoke plant, type 301, in manufacture of cooked sausage.

Fleisch. 33(9); 1979; 173-4 (German)

- 842 SIELAFF (H), THIEMIG (F), WEISS (G), BEESKOW (J) and ARNDT (D). Effective manufacture of cooked sausages without casing.

Fleisch. 33(9); 1979; 177-8 (German)

With the exception of liver sausage, all other cooked sausages are suited for production without use of casings. Suggestion has been given to change the present process and to take up internal coating of boxes with silicon NH 2007 instead of using polyethylene bags in order to obtain better packing. The productivity is increased by these measures, and the losses due to cooking and cooling and also the material costs are reduced. These advantages justify the processing of products without the casing on a large scale. VR

- 843 ZOHRER (P) and BAIER (A). Conference on the manufacture of sausages without casing.

Fleisch. 33(9); 1979; 178

BEEF

- 844 ANDERSON (ME), MARSHALL (RT), STRINGER (WC) and NAUMANN (HD). Evaluation of a prototype beef carcass washer in a commercial plant.

J. Food Prot. 44(1); 1981; 35-8

The experimental results demonstrate that machine washing is at least as effective as careful hand washing in reducing the microbial load of beef half-carcasses. However, 12.5% of hand-washed carcasses, and 22.5% of machine-washed carcasses contained defects caused by hair. KMD

- 845 MURRAY (AC), DOORNENBAL (H) and MARTIN (AH). Relationship of mineral content and tenderness of meat from cattle differing in breed, sex and age.

J. Food Sci. 47(1); 1982; 49-51

- 846 DOORNENBAL (H) and MURRAY (AC). Effects of age, breed, sex and muscle on certain mineral concentrations in cattle.

J. Food Sci. 47(1); 1982; 55-8

- 847 GREENE (BE) and CUMUZE (TH). Relationship between TBA numbers and inexperienced panelists' assessments of oxidized flavour in cooked beef.

J. Food Sci. 47(1); 1982; 52-4, 58

- 848 RAY (EE), STIFFLER (DM) and BERRY (BW). Effects of electrical stimulation and hot-boning on physical changes, cooking time and losses, and tenderness of beef roasts. J. Food Sci. 47(1); 1982; 210-13
- 849 OCKERMAN (HW) and DOWIERCIAL (R). Evaluation of 54 and 60 C holding temperatures on aerobic plate counts and coliform determinations of control and post cooking contaminated beef roast. J. Food Sci. 47(1); 1982; 226-7, 245
- 850 CHASTAIN (MF), HUFFMAN (DL) and BERTRAM (S). Sensory evaluation of forage- and grain-fed beef. J. Food Sci. 47(1); 1982; 340-41
- 851 TERRELL (RN), JACOBS (JA), SAVELL (JW) and SMITH (GC). Properties of frankfurters made from electrically stimulated beef. J. Food Sci. 47(1); 1982; 344-5
- 852 EISELE (TA), BREKKE (CJ) and McCURDY (SM). Nutritional properties and metabolic studies of acylated beef heart myofibrillar proteins. J. Food Sci. 47(1); 1982; 43-8, 51
- 853 SMITH (AM), EVANS (DA) and BUCK (EM). Growth and survival of *Clostridium perfringens* in rare beef prepared in a water bath. J. Food Prot. 44(1); 1981; 9-14
- When beef was cooked in a water-bath to an internal temperature of 60 C, and held for 12 minutes, the population of *C. perfringens* was reduced by 3 log cycles. To decrease the risk of subsequent outgrowths of *C. perfringens*, roasts (≤ 1.5 kg) should be heated so as to produce a 12-log reduction in population; this can be achieved by maintaining the internal temperature at 60 C for 2.3 hour or longer. Recommendations have been made for cooking and cooling roasts to minimize microbiological problems. KMD
- 854 ALI (FS) and VAN DUYNE (FO). Microbial quality of ground beef after simulated freezer failure. J. Food Prot. 44(1); 1981; 62-5

PORK

- 855 ALLEN (P), RIORDAN (PB), HANRAHAN (TJ) and JOSEPH (RL). Production and quality of boar and castrate bacon 1: Pig production, in-factory processing and carcass value. Ir. J. Food Sci. Technol. 5(2); 1981; 93-104
- 856 COWAN (CA) and JOSEPH (RL). Production and quality of boar and castrate bacon 2: Consumer and panel response to bacon and fat samples. Ir. J. Food Sci. Technol. 5(2); 1981; 105-16
- 857 McBRIDE (RL) and RICHARDSON (KC). Acceptability of chilled and frozen ham. CSIRO Food Res. Q. 41(2); 1981; 44-6
- 858 BORGATTI (AR), LENAZ (G), SECHI (AM), TRIGARI (G), PAGLIARANI (A) and VENTRELLA (V). Studies in lipid composition and physical state of liver and heart mitochondria and microsomes in pigs fed on diets containing dried biomass of *Candida lipolytica* (Toprina). J. Food Sci. 47(1); 1982; 59-64

The studies were conducted with pigs by feeding 0%, 15%, and 30% of Toprina. It was found that as usual with all dietary lipids, the Toprina lipids comprising of odd-chain higher fatty acids incorporated themselves as structural components of all lipid fraction of mitochondria and microsomes of pig livers and hearts. However, there were no variation of membrane fluidity nor were there any changes in mitochondrial AT pase activity, sensitive to membrane lipid composition. MVG

859 AMUNDSON (CM), SEBRANEK (JG), RUST (RE), KRAFT (AA), WAGNER (MK) and ROBACH (MC). Effect of belly composition on sorbate-cured bacon. J. Food Sci. 47(1); 1982; 218-21

860 AMUNDSON (CM), SEBRANEK (JG), KRAFT (AA), RUST (RE), WAGNER (MK) and ROBACH (MC). Effect of belly handling (chilled, frozen, prerigor) and smoking delay on regular and sorbate cured bacon.

CHICKEN

861 CHAMBERS (E), BOWERS (JA), PRUSA (K) and CRAIG (J). Sensory attributes and Instron measurements of reduced nitrite poultry frankfurters with sorbic acid or potassium sorbate. J. Food Sci. 47(1); 1982; 207-9

Effects of sorbic acid and potassium sorbate in poultry frankfurters with 0 and 40 ppm nitrite on the sensory attributes, mechanical textural characteristics and residual nitrite were evaluated. Both sorbic acid and potassium sorbate had no influence over flavour characteristics. Sorbic acid-added frankfurters were softer and sorbate-added frankfurters were firmer than those without. Nitrite alone increased firmness and sorbic acid appeared to counteract, this increase while sorbate enhanced the increase in firmness. The sensory firmness scores were corroborated by Instron measurements. Sorbic acid-treated frankfurters had lower pH than those with other treatments. MVG

862 CRAVEN (SE), BLANKENSHIP (LC) and McDONEL (JL). Relationship of sporulation, enterotoxin formation and spoilage during growth of *Clostridium perfringens* Type A in cooked chicken. Appl. Environ. Microbiol. 41(5); 1981; 1184-91

Sporulation and enterotoxin formation were determined for 17 strains of *Clostridium perfringens* type A in autoclaved chicken dark meat and in Duncan-Strong sporulation medium. The mean numbers of heat-resistant spores detected after 24 hours at 37 C were $\log_{10}$ 1.13 to $\log_{10}$ 7.64/ml in Duncan-Strong medium and $\log_{10}$ 4.93 to $\log_{10}$ 6.59/g in chicken. Of 17 strains, 7 formed enterotoxin in Duncan-Strong culture supernatant (1.0 to 60 μ g/ml) and 8 produced enterotoxin in chicken (0.21 to 24 μ g/g). Additional studies with chicken were conducted with *C. perfringens* NCTC 8239. With an inoculum of 10^6 cells per g, $>\log_{10}$ 7.99 vegetative cells per g were detected by 4 hours in chicken at 37 C. Heat-resistant spores occurred by 4 and 6 hours and enterotoxin occurred by 8 and 6 hours in autoclaved chicken dark meat and barbecued chicken drumsticks, respectively. Enterotoxin was detected in autoclaved dark meat after incubation at 45 C for 1.5 hours followed by 37 C for 4.5 hours, but not after incubation at 45 C for 1.5 to 8 hours. With an inoculum of 10^2 cells per g in oven-cooked or autoclaved chicken, $>\log_{10}$ 8.00 vegetative cells per g were detected by 6 and 8 hours at 37 C, heat-resistant spores were detected by 8 hours and enterotoxin was detected by 12 hours. A statistical analysis of odour determinations of chicken after growth of *C. perfringens* indicated that, at the 95% confidence level, the product was considered spoiled (off or unwholesome odour) by the time spores or enterotoxin were formed. AA

863 ANG (CYW). Comparison of sample storage methods for vitamin B₆ assay in broiler meat. J. Food Sci. 47(1); 1982; 336-7

TURKEY

864 DENTON (JH) and GARDNER (FA). Effects of further processing systems on selected microbiological attributes of turkey meat products. J. Food Sci. 47(1); 1982; 214-7

SEAFOODS

- 865 KISSAM (AD), NELSON (RW), NGAO (J) and HUNTER (P). Water-thawing of fish using low frequency acoustics. J. Food Sci. 47(2); 1982; 71-5
 Plate frozen pacific cod blocks (91 mm thickness and 12.7 kg) were thawed in circulated water bath (18 C) and simultaneously exposed to 1500 Hz acoustic energy (upto 60 watts). The controls were thawed only in water. The desired light contact was obtained by a ceramic transducer and the block was moved by a motorised belt so as to distribute the transducer (239 cm²) over the block surface (1500 cm²). The blocks exposed to acoustics 60 watts continuous input to transducer thawed in 71% less time than controls. No adverse effects attributable to acoustic waves were noticed in the flesh. MVG
- 866 RAYNER (ET), DUPUY (HP), LEGENDRE (MG), GRODMER (RM), COOK (JA), NOVAK (AF) and TOLODAY (DJ). Instrumental analysis of seafood composition. J. Food Sci. 47(2); 1982; 76-8
 Volatile contents of seafood products such as fish, crabs, shrimp and aqueous solution from oysters were analysed by direct gas chromatography and mass spectrometry. It was found that the compounds associated with freshness quality of the products could be detected and identified effectively and rapidly. MVG

FISH

- 867 KRISHNA IYER (H), SRINIVASA RAO (P), UNNITHAN (GR), KESAVAN NAIR (AK) and NAIR (RG). Survey on the idle capacity of fish processing (freezing) plants in India. II. East coast. Fish. Technol. 19(1); 1982; 9-14
 Fish processing (freezing) plants from the East Coast of India were surveyed during 1978 and 1979 for idle capacity by stratified random sampling. The idle capacity was estimated to be 75.9% and 72.5% for the years 1978 and 1979 respectively on the basis of 250 working days per annum and two shifts per day. The under utilisation of plants was attributed mainly to non-availability of raw material, high cost of production, power shortage, scarcity of ice and potable water during peak season and frequent labour trouble. MVG
- 868 BACHHIL (VN). Response of extract release volume to the variations in pH and microbial load during spoilage of fish at refrigeration temperature. Fishery Technol. 19(1); 1982; 55-7
 Fish raised under composite fish culture reared in livestock sewage fed pond were refrigerated for 10 days and analysed for microbial load, pH and extract release volume on 1st, 4th, 7th and 10 days. Mesophiles and psychrophiles increased during refrigerated storage. The increase was slow upto 4th day and was comparatively rapid thereafter. The fish were acceptable organoleptically on 4th day, but on 7th day they showed signs of spoilage. The lower rate of increase of bacterial load was due to lower pH, which started increasing after the 4th day. The ERV decreased as the pH and microbial counts increased; on an average, it reduced to 14.6 on 7th day and at clear spoilage, it came down to 7.4. The fish spoilage flora, however, did not in general, show a tendency for attacking insoluble proteins of the fish. MVG
- 869 BROOKE(PJ) and EVANS (WH). Determination of total inorganic arsenic in fish, shellfish and fish products. Analyst. 106(1262); 1981; 514-20
 Two methods are described for the determination of total inorganic arsenic in fish and fish products. The first method involves separation

of the inorganic arsenic by distilling it from 6.6 N hydrochloric acid. The second method involves chelation and extraction of inorganic arsenic after sample dissolution in sodium hydroxide solution, with subsequent back-extraction and oxidation. In both methods, the arsenic concentration is measured, after hydride generation by atomic-absorption spectrophotometry with atomisation in a flame-heated silica tube: with the first method the solution contains arsenic (III), and in the second the solution contains arsenic (V). Results obtained by both methods are in agreement over a range of samples. The distillation method is favoured for reasons of efficiency and economy in time. The derived limit of detection and confidence intervals are given. AA

- 870 OREJANA (FM) and LISTON (J). Agents of proteolysis and its inhibition in patis (fish sauce) fermentation. J. Food Sci. 47(1); 1982; 198-203, 209
- 871 RAVINDRANATHAN NAIR (P), THANKAMMA (R) and GOPAKUMAR (K). Biochemical changes of fish fingers held at frozen storage. Fish. Technol. 19(1); 1982; 19-23

Fish fingers prepared from fresh threadfin bream and semi-fatty horse mackerel were frozen stored for 6 months and studied periodically for biochemical changes. One of the samples from each fish was incorporated with 0.01 monosodium glutamate (MSG). The parameters studied were peroxide value, thiobarbituric acid value and free fatty acids. The study indicated that all the parameters were affected by the lipid in fish meat. Incorporation of MSG improved the flavour of fish fingers. In the case of horse mackerel, further application of batter on the fish fingers imparted some protective effect. MVG

SARDINE

- 872 SURENDRAN (PK) and GOPAKUMAR (K). Bacterial flora of EDTA treated oil sardine (*Sardinella longiceps*), Indian mackerel (*Rastrelliger Kanagurta*) and prawn (*Metapenaeus dobsoni*) in ice storage. Fish. Technol. 19(1); 1982; 33-39

Fresh oil sardine, mackerel and prawn were dipped (within 2 to 4 hours after catch) in Na₂ EDTA (1000 and 10,000 ppm) for 10 minutes drained, packed in crushed ice (fish to ice ratio 1:1); and stored in thermocole insulated ice boxes for 25 days. The ice loss was made up on alternate days. The samples were analyzed at intervals. It was found that the native microflora comprised mainly of *Pseudomonas* sp., *Moraxella* sp., *Acinetobacter* sp. and *Vibrio* sp. In oil sardine and mackerel, during spoilage of ice, nearly 75% of the bacterial flora belonged to *Pseudomonas* sp. Na₂ EDTA reduced the proportion of *Pseudomonas* sp. considerably thus making the *Moraxella* sp. and *Acinetobacter* sp. as major bacterial groups at the time of spoilage. In the case of prawn, *Moraxella* sp. and *Acinetobacter* sp. predominated during spoilage in ice, together constituting 74% of the total population. Na₂ EDTA did not alter significantly the spoilage flora of prawns. MVG

ROCKFISH

- 873 PARKIN (KL), WELLS (MJ) and BROWN (WD). Modified atmosphere storage of rockfish fillets. J. Food Sci. 47(1); 1982; 181-4

A modified atmosphere (MA) of 80% CO₂ and 20% air was effective in extending shelf life of fresh rockfish fillets. Aerobic plate counts and trimethylamine levels were significantly lower ($P < 0.1\%$) for the fillets held in MA compared to those held in air. A decline in surface pH was observed on fillets stored in MA, presumably due to the absorption of CO₂ and its hydration to carbonic acid. Oxidation-reduction potentials suggested a more aerobic environment on fillets stored in MA. There were no significant differences in weight loss between control

and MA samples. Sensory evaluation indicated that fillets held under MA were of good quality for at least 13 days of storage. AA

RED HAKE

- 874 KELLEHER (SD), BUCK (EM), HULTIN (HO), PARKIN (KL), LICCIARDELLO (JJ) and DAMON (RA) Jr. Chemical and physical changes in red hake blocks during frozen storage. J. Food Sci. 47(1); 1982; 65-70

MACKEREL TUNA

- 875 BALACHANDRAN (KK), VIJAYAN (PK) and JOSEPH (J). Improving the acceptability of canned mackerel tune (*Euthynnus affinis*). Fish. Technol. 19(1); 1982; 59-60

Dry red chilly powder was suspended in vegetable oil and gently warmed to extract the colour and flavour of chilli and the oil decanted. This was repeated until most of the colour was extracted. The combined oil extracts were filtered to remove solid particles and the concentrate thus prepared was suitably diluted with fresh oil. The tuna canned in this oil had a better appearance than tuna canned in unspiced oil. Although the meat did not absorb any colour from the oil, the taste, flavour and odour were better with spiced oil. The product stored well for 1 year. The storage period increased the absorption of the spicy flavour by the meat and this improved the taste and flavour considerably. MVG

- 876 CHU (C-H) and BJELDANES (LF). Effect of diamines, polyamines and tuna fish extracts on the binding of histamine to mucin *in vitro*. J. Food Sci. 47(2); 1982; 79-80, 88

Binding of (ring-2-¹⁴C)-histamine to mucin was studied. Maximum binding of 2.5 μ mol histamine/ μ mol mucine was observed at a histamine concentration of 0.5 mg/ml. Histamine binding was decreased by 4.65% by spermine, 25.3% by spermidine, 9.5% by cadaverine, and 11.1% by putrescine. These maximum effects were observed at molar ratios of histamine to polyamine of 1:1 for spermine and spermidine, 1:2 for cadaverine, and 1:2.3 for putrescine. The relative effects on histamine binding to mucin of extracts from wholesome canned tuna fish and a mixture of spermine, spermidine, cadaverine and putrescine were also examined. Although the total neutral aqueous extract of tuna had little effect on histamine-mucin binding (5.4% inhibition), the extract of bases from tuna and the prepared base mixture showed maximum inhibition of histamine binding to mucin of 23.1% and 21.4%, respectively. Certain other components of tuna extracts (NaCl, aspartic acid and glutamic acid) did not decrease histamine-mucin binding under the conditions used. AA

ENGLISH SOLE

- 877 YUH-MEI CHUNG and LEE (JS). Inhibition of microbial growth in English sole (*Parophrys retulus*). J. Food Prot. 44(1); 1981; 66-8

When potassium sorbate was added at 0, 0.1, and 1.0% levels to English sole (*Parophrys retulus*) homogenate, it did not alter the typical microbial spoilage pattern. KMD

GHO L

- 878 GARG (DK), STEPHAN (J) and VALSAN (AP). Studies on frozen storage of ghol (*Pseudosciaena diacanthus*). Fish. Technol. 19(1); 1982; 29-31

GRAY FISH

- 879 JHAVERI (SN) and CONSTANTINIDES (SM). Chemical composition and shelf life study of grayfish (*Squalus acanthias*).
J. Food Sci. 47(1); 1982; 188-92

KATI

- 880 GARG (DK) and STEPHEN (J). Ice storage studies of Kati (*Pellona* sp.).
Fish. Technol. 19(1); 1982; 45-7

Fresh kati of uniform size (2-4 nos. per kg) from local landings at Bombay were washed and stored for 13 days in insulated box provided with a raised perforated platform and along with ice (in 1:1 ratio). Periodically the ice lost was replenished. The biochemical moisture, total N, α -amino N, free fatty acid, and thiobarbituric acid, bacteriological and organoleptic studies on the stored fish indicated that kati stored well in ice for 9 days without appreciable loss in overall quality. MVG

CRAB

- 881 LYNT (RK), KAUTTER (DA) and SOLOMON (HM). Heat resistance of proteolytic *Clostridium botulinum* type F in phosphate buffer and crabmeat.
J. Food Sci. 47(1); 1982; 204-6, 230

CLAM

- 882 VIJAYAN (PK), PERIGREEN (PA), SURENDRAN (PK) and BALACHANDRAN (KK). Processing clam meat into pickles.
Fish. Technol. 19(1); 1982; 25-8

Pickles from clam (*Velorita* sp.) meat were prepared according to several recipes developed and evaluated for bacteriological quality, at different stages of processing and during 8 month storage period. The pickles were stored well at ambient temperature for six months in sealed air tight bottles. Frying before pickling had added advantage in maintaining bacteriological quality. MVG

- 883 GHANBARI (HA), WHEELER (WB) and KIRK (JR). The fate of hypochlorous acid during shrimp processing: A model system.
J. Food Sci. 47(1); 1982; 185-7, 197

After immersion of shrimp in a 100 mg/L solution of HO^{36}Cl , the distribution and chemical forms of chlorine water determined. There was a 2-5% loss of Cl_2 into the atmosphere, but no significant photolysis of HOCl was measured during the 30 minutes of treatment. More than 80% of the HOCl reacted during the incubation period, forming Cl^- or incorporating into organic molecules. Only 1-3% ^{36}Cl was incorporated into the shrimp. Organic molecules in the immersion solution also showed ^{36}Cl incorporation; the 10,000 x g precipitable fraction contained 2-5% ^{36}Cl and the soluble organic fraction 1-2% ^{36}Cl . AA

MUSSEL

- 884 MURALEEDHARAN (V), JOSEPH (G) and DEVADASAN (K). Pickled products from green mussel.
Fish. Technol. 19(1); 1982; 41-3

Ready-to-serve pickled products from dried, fried and light smoked green mussel (*Perna viridis*) were prepared and assessed for their storage characteristics. While all the products could be stored for 180 days, the smoked and pickled product showed a slightly better shelf life of 200 days, as the smoky flavour was reduced. The other

products softened and disintegrated at the end of six months and stray patches of fungus were also observed on the top layer. MVG

PROTEIN FOODS

Nil

FRUIT JUICES AND BEVERAGES

- 885 MAYANNA (SM) and JAYARAM (B). Determination of caffeine using sodium N-chloro-p-toluenesulphonamide.
Analyst. 106(1263); 1981; 729-32

Outlines a titrimetric method for determination of caffeine in several products including beverages (both alcoholic and nonalcoholic) using sodium-N-chloro-p-toluenesulphonamide (chloramine-T, CAT). BSN

- 886 REINTJES (HJ). Aseptic filling of fruit juices and concentrates in large bags.
Flussiges Obst. 47(6); 1980; 254-5 (German)

- 887 STACY (JD). Powdered beverages.
Flussiges Obst. 47(6); 1980; 250-4 (German)

- 888 BIELIG (HJ). Dietetic juice based beverages poor in calories. Production and problems of declaration.
Flussiges Obst. 47(6); 1980; 248-50 (German)

The article deals with the possibilities of preparing dietetic fruit-juice beverages which are poor in calories or which have a reduced caloric content; the limits of the preparation of other dietetic soft drinks are discussed. The application of the essential decrees and general instructions as well as contested questions concerning the declaration have been referred to. AA

CITRUS JUICE

- 889 PICCIOLO (P) and LANZA (G). Qualitative and quantitative determination of the amino acids in citrus juices by means of gas chromatography.
Flussiges Obst. 47(6); 1980; 245-8 (German)

The amino acids are isolated from the juice with an ion exchanger, they are cleaned and transformed afterwards into volatile derivatives. The gas chromatographic determination is made with the aid of glass columns. The results of the amino acid analysis of lemon and orange juice are compared with data mentioned in the literature which were obtained with an amino acid analyser. Direct comparison of both methods is made, in case of orange juice. This method can be used for routine analyses, because it is quick and cheap. AA

LIME JUICE

- 890 EL-BAKI (MM), EL-SAMAHY (SK) and ASKAR (A). Concentration of fruit juices. 1. Concentration of lime juice.
Flussiges Obst. 47(6); 1980; 234-8 (German)

This study was carried out to study the possibility of freeze-concentration, in comparison to concentration by heating under vacuum, of lime juice. Changes that occurred and quality of juice during concentration and during storage at -12 C and 5 C were determined using organoleptic tests and several chemical characteristics (limonene, ester, carbonyl, oxygenated terpenes, infrared spectra of the aroma compounds,

ascorbic acid content, acidity, sugars, pulp and colour index). Freeze concentration proved to be more advantageous than heating under vacuum for the production of concentrated natural lime juice. The quality of the concentrate was very good. Moreover, storage of the concentrate at -12 C for 4 months is preferable. The quality was still good after eight months of storage at the same temperature. AA

APPLE

- 891 HUMS (N), KRUG (K), HEES (E) and STORZ (H). The stabilization of apple juice with polyvinylpyrrolidone (PVPP) in recycling. *Flussiges Obst*. 47(6); 1980; 238-40 (German)

A process for stabilization of preconcentrated apple-juice and of its regeneration with the aid of PVPP has been described. Polyphenols and the so-called preliminary stages of tannins are also eliminated by this process. The qualities of PVPP have been mentioned and the stabilizing plant as well as the operation are described. The results of the polyphenol determinations obtained during various stabilizations have been summed up in a table, the profitability of the stabilization has been shown. AA

SOFT DRINKS

- 892 ANON. Soft drinks. Part II. *Food Manuf.* 56(12); 1981; 38-9
- 893 WOOLLEN (A). The soft drink scene. *Food Manuf.* 56(11); 1981; 55, 59

WINE

- 894 AARJU (K) and RONKAINEN (P). Analysis of wines for metals using atomic-absorption spectrophotometry. *Z. Lebensmittel-Unters. Forsch.* 170; 1980; 445-8
- Ca, Cd, Cr, Cu, Fe, K, Li, Mg, Mn, Na, Pb and Zn were determined using atomic absorption spectrophotometry (AAS) in 59 Finnish (n = 10) and foreign (n = 49) wines sold in Finland. Cd and Pb were determined in a graphite furnace and other metals with an air-acetylene flame. All wines contained only low levels of heavy metals; in all cases the contents of Pb, Cu, Zn and Cd were below 0.3, 0.5, 5.0 and 0.1 mg/l, which are the maximum levels permitted in some countries. Finnish wines contained less Pb and Mg and more Cr and Na than the foreign wines analysed. AA
- 895 FAPARUSI (SI). Sugars identified in *Raphia* palm wine. *Food Chem.* 7(2); 1981; 81-6

BEER

- 896 CAUWE (Y). Recent developments in malting plants. *J. Inst. Brew.* 87(5); 1981; 277-8
- 897 PRIEST (FG). The classification and nomenclature of brewing bacteria: A review. *J. Inst. Brew.* 87(5); 1981; 279-81
- 898 HALL (SC). Micro-malting trials 1979-80. *J. Inst. Brew.* 87(5); 1981; 2 2-5
- Four varieties from the 1979 barley crop were evaluated, *Atem*, *Claret*, *Tintern*, and *Triumph*. All four were found to malt satisfactorily both with and without gibberellic acid at 4 and 6 days germination respectively. AA

- 899 PALMER (GH) and TAYLOR (JA). Acetic orcein staining test for assessment of pregermination in barley.
J. Inst. Brew. 87(5); 1981; 286-8
- 900 QUAIN (DE). The determination of glycogen in yeasts.
J. Inst. Brew. 87(5); 1981; 289-91
- 901 YOUNG (TW). The genetic manipulation of killer character into brewing yeast.
J. Inst. Brew. 87(5); 1981; 292-5
- 902 SUOMALAINEN (H). Yeast esterases and aroma esters in alcoholic beverages.
J. Inst. Brew. 87(5); 1981; 296-300
- 903 BATHGATE (GN). The determination of fermentable extract in brewing worts.
J. Inst. Brew. 87(5); 1981; 301-2

WHISKY

- 904 MASUDA (M) and NISHIMURA (K). Changes in volatile sulphur compounds of whisky during aging.
J. Food Sci. 47(1); 1982; 101-5

OILS AND FATS

- 905 HIRSINGER (F). Cuphea. The first annual oil plant for the production of medium-chain triglycerides.
Fette Seifen Anstrichm. 82(10); 1980; 385-9 (German)
- 906 SEHER (A), SCHILLER (H), KROHN (M) and WERNER (G). Investigations on oil samples from archaeological findings.
Fette Seifen Anstrichm. 82(10); 1980; 395-9 (German)
Investigations on the residue in a broken jar, that was found during excavations in Egypt, which probably date back to sixth century B.C. revealed the presence of intact long-chain saturated, n-, iso- and ante-iso fatty acids as well as wax esters. Moreover, products of oxidation of unsaturated fatty acids and terpenes were detected. The results obtained by preliminary chromatographic separation and GC-MS-coupling suggest and that originally a mixture of beef tallow and coniferous oils, possibly with the addition of essential oils was present. AA
- 907 FEHSENFELD (B), KLEIN (F) and KNUTH (M). Identification and regulation of plants in the edible oil industry.
Fette Seifen Anstrichm. 82(10); 1980; 402-7 (German)
- 908 DAFFERTSHOFER (G). The aromatization of fat-containing fill masses.
Gordian. 80(10); 1980; 231-2 (German)
- 909 WOERTEL (JB). Bulk handling of fats and oils.
Cereal Food World. 26(9); 1981; 446-8,
Aspects considered include, quantity and transportation, technical consideration with respect to contamination, overheating and exposure to air, bulk oil holding systems, heating, agitation, pumping and piping, fluid flow and heat transfer, measurement of oil, quality evaluation and processing. KAR
- 910 VOM BRUCK (CG), FIGGE (K) and RUDOLPH (F). Interaction of fat-containing food with plastics packaging.
J. Am. Oil Chem. Soc. 58(8); 1981; 811-5
Two main effects caused by the interaction of fatty food components

with plastic packaging materials are described: stress cracking and migration. A method for characterizing fatty foodstuffs was developed to distinguish between foodstuffs containing free fat available on the surface and those actually having an aqueous surface. The basic types of migration behaviour are shown by typical migration curves of an antioxidant from rigid PVC and from HD-PE into test fat. A theory was developed with which it is possible to describe the migration behaviour of antioxidants from polyolefins and PVC quite precisely. It is recommended that regulations for plastic food packaging are based on compositional limits, rather than migration limits, because of definite advantages in compliance and control. AA

- 911 ANON. Swiss regulations on permissible marking and labelling, in respect of the content of essential fatty acids. Voeding. 41(4); 1980; 160
The essential fatty acid (EFA) requirement for a human being has been specified as 10 g of linoleic (cis-cis 9,12-octadecadienoic) acid per day. No statement should be made if the linoleic acid content of the food fat is less than 10%. If the food fat contains 10-25% linoleic acid, then the item can be marked as "contains linoleic acid" or "contains EFA". If the linoleic acid content is more than 25%, then the item may be labelled as "rich in linoleic acid" or "rich in EFA". KMD
- 912 FARAG (RS), OSMAN (SA), HALLABO (SAS) and NASR (AA). Linoleic acid oxidation catalysed by various amino acids and cupric ions in aqueous media. Fette Seifen Anstrichm. 82(10); 1980; 390-4
- 913 GARTI (N).and AVNI (E). Permanganate oxidation of oleic acid using emulsion technology. J. Am. Oil Chem. Soc. 58(8); 1981; 840-41

SPICES AND CONDIMENTS

CHILLI

- 914 BUCHANAN (RL), GOLDSTEIN (S) and BUDROE (JD). Examination of chili pepper and nutmeg oleoresins using the *Salmonella*/mammalian microsome mutagenicity assay. J. Food Sci. 47(1); 1982; 330-31, 333
Past investigations have suggested that various arylalkene spices compounds warrant further study as possible naturally occurring mutagens and/or carcinogens. The present study carried out a detailed examination of nutmeg oleoresin, myristicin, chili pepper oleoresin, capsaicin, and vanillylamine for *in vitro* mutagenicity using the *Salmonella*/mammalian microsome mutagenicity assay. None of the materials tested displayed significant mutagenicity over a wide range of concentrations. AA

CORIANDER

- 915 LAKSHMINARAYANA (G), RAO (KVSA), SITA DEVI (K) and KAIMAL (TNB). Changes in fatty acids during maturation of *Coriandrum sativum* seeds. J. Am. Oil Chem. Soc. 58(8); 1981; 838-9
Changes in fatty acids were studied during maturation of *Coriandrum sativum* seeds. The seeds matured in 50 days after flowering. Lipid synthesis proceeded at a steady rate up to 40 days after flowering. Reductive ozonolysis of the monoenes followed by gas liquid chromatographic analysis of the aldehydic fragments as dioxolanes of 1,3-propenediol was employed to estimate petroselenate (octadeca-cis-6-enoate) in the presence of oleate (octadeca-cis-9-enoate). Petroselenic acid was the major fatty acid at all stages. AA

SENSORY EVALUATION

- 916 VICKERS (ZM). Relationships of chewing sounds to judgements of crispness, crunchiness and hardness.
J. Food Sci. 47(1); 1982; 121-4
The relationships between oral and auditory judgements of crispness, crunchiness and hardness were examined. Twenty subjects used magnitude estimation to judge the crispness, crunchiness and hardness of sixteen food items and sixteen tape recorded biting and chewing sounds. Correlations between oral and auditory judgements of each attribute were generally large. In addition, all three attributes appear to be very closely related. AA
- 917 FRIJTERS (JER). Expanded tables for conversion of a proportion of correct responses (P_c) to the measure of sensory differences (d') for the triangular method and the 3-alternative forced, choice procedure.
J. Food Sci. 47(1); 1982; 139-43

FOOD STORAGE

Nil

INFESTATION CONTROL AND PESTICIDES

- 918 AKERSTRAND (K). Ergots.
Var Foda. 32(9); 1980; 442-6 (Swedish)
Ergots, which were supposed to be practically eradicated from Swedish grains, were found again in grains of rye in 1978. Microscopic examination of flour was carried out according to the methods described in the literature. But none of the standard could be regarded as satisfactory for the determination of ergots in flour. Hence, grains should be examined for ergot infestation before they are ground into flour. Then it is easy to pick out suspected particles of ergots, and to confirm them by microscopy. KMD
- 919 SAXENA (MC), SIDDIQUI (MKJ), BHARGAVA (AK), KRISHNAMURTI (CR) and KUTTY (D). Placental transfer of pesticides in humans.
Arch. Toxicol. 48(2/3); 1981; 127-34
- 920 ZAMOLA (B), VALLES (P), MELI (G), MICCOLI (P) and KAIFEZ (F). Use of the centrifugal separation technique in manufacturing a bioinsecticide based on *Bacillus thuringiensis*.
Biotechnol. Bioeng. 23(5); 1981; 1079-86

BIOCHEMISTRY AND NUTRITION

- 921 SCHOWEN (KB) and SCHOWEN (RL). The use of isotope effects to elucidate enzyme mechanisms.
Bioscience. 31(11); 1981; 826-31
Discusses: isotopic investigation of enzyme mechanisms; origin and interpretation of kinetic isotope effects; transition state compressor as a strategy; importance of natural substrates; and termination point of enzyme evolution. BSN
- 922 KAN (TA) and SHIPE (WF). Modification and evaluation of a reverse phase high performance liquid chromatographic method for amino acid analysis.
J. Food Sci. 47(1); 1982; 338-9, 341

- 923 SKURRAY (GR). A rapid method for selectively determining small amounts of niacin, riboflavin and thiamine in foods.
Food Chem. 7(1); 1981; 77-80
Niacin, riboflavin and thiamine (as thiochrome) were determined in enzymic hydrolysates of foods by high performance liquid chromatography. Paired ion chromatography, combined with ultraviolet and fluorescent spectroscopy, allowed for highly selective and sensitive detection of the vitamins. The results of the assays were similar to the more time-consuming manual methods but the accuracy and sensitivity were much higher using fluorescent detection. AA
- 924 RAO (VKRV). Some nutritional puzzles.
Econ. Pol. Wkly. 16(28-29); 1981; 1205-8
- 925 FERNANDES (J). Nutrition research and paediatrics.
Voeding. 41(3); 1980; 78-83
- 926 RUTTEN (MWCh). Injury to the system and diet therapy.
Voeding. 41(3); 1980; 96-9
Keeping to a prescribed diet does not occur in isolation but within the context of an entire constellation of environmental factors. The very same factors contributed to the final manifestation of the illness that induced the (consulted) physician to prescribe a certain diet. This paraphrase of Sims (5) seems appropriate to start an article in which a systems approach is used in an effort to come to grips with the complex situations in which the Nutrition Care System has to bring patients to change their food habits. One of these situations is the household, another the hospital. It seems possible that representing these situations as systems, will throw more light on the assessment of situations in which patients have to change their habits, possible bottlenecks and suitable help. AA
- 927 SWEN (I) and VEERMAN (H). The adoption of a prescribed diet - Listing and analysis of factors that play a role in the non-adoption of a prescribed diet.
Voeding. 42(2); 1980; 59-64
With the technique of participant observation, data were collected from 99 patients suffering from heart diseases on the problems they encountered, in- and outside the hospital, with the diets prescribed to them and the help they got to overcome them. (5) Van Beugem's model for behavioural change (1) was applied in classifying and analysing the collected data. From this analysis it had to be concluded, that the help professionals gave these patients was almost completely restricted to imparting nutritional knowledge and skills in selecting and handling food. Hardly any help was given on the very essential but more hidden aspects of behavioural change which are more social and psychic in nature (e.g. how to cope with hard feelings aroused by the taste and image of new food pattern or by the reactions of other people to your new foodways). From Van Beugem's model it had to be concluded, that nutrition education will always fall short of its own expectations as long as not enough and not equal attention is given to each one of the three dimensions of behavioural change (knowledge and skills and feelings) and if those are not properly and conscientiously coordinated. AA
- 928 THOMPSON (SA) and WEBER (CW). Copper and zinc binding to dietary fibre sources: An ion exchange column method.
J. Food Sci. 47(1); 1982; 125-6, 133
Fibre residues from fibre sources subjected to neutral detergent and enzymatic treatments were tested for ion-exchange capacities for copper and zinc. Both residues did not have equivalent physical properties. It was also shown that binding abilities varied dramatically with the types of dietary fibre sources. MVG

- 29 SHIER (NW), HEINRICHS (TF) and HART (W). Effects of diet on urinary 1-ascorbic acid in the human.
J. Food Sci. 47(1); 1982; 334-5, 337
- 30 BUTTOLPH (ML), MISA (T) and NEWBERNE (PM). Effects of caramel diets and other dietary manipulations on cecal enlargement, kidney pathology and hematology.
Nutr. Rep. Int. 23(6); 1981; 1043-54
Dietary manipulation was shown to affect cecal enlargement; the type of carbohydrate fed appears to be the major contributing factor, although magnesium and zinc content play a role. KAR
- 31 SARWAR (G) and McLAUGHLAN (JM). Relative net protein ratio method for evaluating protein quality.
Nutr. Rep. Int. 23(6); 1981; 1157-66

TOXICOLOGY AND HYGIENE

- 932 DICKIE (M). Food contamination and its prevention.
Food Flavour. Ingrid. Packag. 3(11); 1981; 48-9
- 933 ZBINDEN (G). Experimental methods in behavioural teratology.
Arch. Toxicol. 48(2/3); 1981; 69-88
- 934 CHOISY (C) and VEISSEYRE (R). Improvement of hygienic conditions in collective food catering.
Ind. Alim. Agric. 97(9); 1980; 903-15 (French)
An educational and technical survey programme was conducted between May 1976 and December 1978, to determine the impact of staff instruction on the level of hygiene in mass catering establishments. It covered 142 firms, responsible for 80,000 meals daily in the Paris region, and also 2,643 persons of whom 403 had managerial status, while the others were supervisory, or low-level staff. The improvement observed in the general level of hygiene in these establishments during the aforesaid period has been reported. The nature and degree of contamination observed, its fluctuations during the period and according to the season, and the influence on it of the size of the establishment have been analyzed and discussed. The new regulations relating to buildings, equipment, and material will undoubtedly promote a higher level of hygiene; but personnel will still remain the determining factor. KMD
- 935 DUNSMORE (DG) and THOMSON (MA). Bacteriological control of food equipment surfaces by cleaning systems. II. Sanitizer effects.
J. Food Prot. 44(1); 1981; 21-7
Iodophore sanitizers can provide the most effective system component in controlling the bacterial populations on stainless steel surfaces that come in contact with milk. When sanitizers were applied for a short contact-time, the post-wash sanitizers were more effective than the pre-milk sanitizers. But application of the sanitizer for the complete intercycle period completely eliminated all viable bacteria, and was much more effective than either of the short contact-time methods. KMD
- 936 BLANKENSHIP (LC). Some characteristics of acid injury and recovery of *Salmonella barielly* in a model system.
J. Food Prot. 44(1); 1981; 73-7
The injury and recovery characteristics of *Salmonella barielly* after treatment with acetic acid in saline solution containing 0.5% sucrose were studied. Injury and death rates were dependent upon acid concentration and temperature. Several enzyme activities were substantially reduced in injured cells. Recovery rates were greater in peptones and casamino acids than in several commonly used culture media. The effects

of a variety of inhibitors and antimetabolites on recovery of acid injured cells indicated that protein and RNA synthesis, as well as electron transport, were necessary for recovery. AA

- 937 MEYER (LB), MARTIN (SE) and WITTER (LD). Combined effect of acetate and reduced water activity on survival of *Salmonella typhimurium* 7136. Appl. Environ. Microbiol. 41(5); 1981; 1173-6
- 938 ZERTUCHE (L) and ZALL (RR). Production of ethanol from cellulose using *Clostridium thermocellum*. J. Food Sci. 47(1); 1982; 328-9
- 939 KAUTTER (DA), LYNT (RK), LILLY (T) Jr. and SOLOMON (HM). Evaluation of the botulism hazard from nitrogen-packed sandwiches. J. Food Prot. 44(1); 1981; 59-61
- 940 SANKARAN (R), LEELA (RK) and VIJAYARAGHAVAN (PK). The occurrence of enterotoxigenic staphylococci in raw, processed and ready-to-eat foods. II. Enterotoxin assay and phage typing. Indian J. Nutr. Dietet. 18(8); 1981; 294-9
One hundred and fifty strains of *Staphylococcus aureus* isolated from various foodstuffs were studied for their enterotoxigenicity. B was the most preponderant followed by E, A and C in that order. Some of the strains produced more than one toxin. There was no correlation between the type of food and the type of enterotoxins produced. The common criterion of taking the coagulase nature for enterotoxigenicity must be viewed with reserve as many coagulase negative strains have been shown to be enterotoxigenic. Attempts at phage typing showed that although the few typable strains belonged to group III, majority of the strains are not typable. Thus, although the overall preponderance of enterotoxigenicity in strains from meat and meat products and dairy products exists, there are significant differences in the frequency of type of toxins produced by the strains compared to reports from other countries. It also indicates that there must be a rethinking on taking note of the coagulase positive strains only in foods as many coagulase negative strains have proved to be enterotoxin producers. (For Part I see Indian J. Nutr. Dietet. 18(6); 1981; 197-203). AA
- 941 HOCKING (AD). Improved media for enumeration of fungi from foods. CSIRO Food Res. Q. 41(1); 1981; 7-11
One problem inherent in counting moulds from foods in the spreading nature of fungal growth. Fungi from the order mucorales are especially troublesome, as their effuse, freely sporing growth habit inhibits colony formation by less vigorous moulds and may cause widespread laboratory contamination. A second inherent problem is that standard mould counting media are of very high water activity and unsuited to the detection and enumeration of the xerophilic fungi encountered in dried foodstuffs. This paper outlines the development of two new media devised to overcome these problems. AA
- 942 PITT (JI). Mycotoxins in human health. CSIRO Food Res. Q. 41(2); 1981; 31-7
In the 1970's, evidence accumulated to show that mycotoxins have been the cause of human disease. There are at least 10 human diseases which are not known to be, or are suspected of being mycotoxicosis. Each of them is reviewed and their possible implications for Australians are discussed. KAR
- 943 FRITZ (W) and ENGST (R). Survey of selected mycotoxins in food. J. Environ. Sci. Health. B16(2); 1981; 193-210
- 944 LEEWELLYN (GC), THOMEN (LE) and KATZEN (JS). Effects of dietary copper on developing aflatoxicosis in Syrian hamsters. J. Environ. Sci. Health. B16(2); 1981; 211-25

- 945 TICE (G) and BUCHANAN (RL). Regulation of aflatoxin biosynthesis: Effect of exogenously supplied cyclic nucleotides.
J. Food Sci. 47(1); 1982; 153-7

The effects of cAMP, cGMP, AMP, and GMP on aflatoxin accumulation were studied using flask and test tube cultures of *Aspergillus parasiticus*. The response to cGMP supplementation was variable, depending on the type of culture system employed. Cyclic AMP produced a dose-related increase in aflatoxin production, with 5.0 mM supplementation resulting in as much as an 18-fold increase in toxin accumulation. Stimulation of aflatoxin production by cAMP was not attributable to nutritional effects, and the results suggest that cAMP may be a key regulatory control point governing aflatoxin biosynthesis. AA

- 946 BUCHANAN (RL), TICE (G) and MARINO (D). Caffeine inhibition of ochratoxin A production
J. Food Sci. 47(1); 1982; 319-21

The effect of caffeine and theobromine on growth and ochratoxin A production by *Aspergillus ochraceus* was determined using microbiological medium. Caffeine produced a small decrease in growth, while reducing ochratoxin production as much as 98%. Theobromine had relatively little effect on growth or ochratoxin production. Screening of caffeine for its effect on the growth of a number of *Aspergillus* and *Penicillium* species indicated that caffeine may have biological activity against a variety of mycotoxigenic molds. AA

- 947 KANGSADALAMPAI (K), SALUNKHE (DK) and SHARMA (RP). Patulin and rubratoxin B: Interactions of toxic and hepatic effects and mutagenic potential.
J. Food Prot. 44(1); 1981; 39-42, 54

GENERAL

- 48 KUNZE (G). Distribution as service.
Gordian. 80(11); 1980; 284-5 (German)

FOOD PROCESSING AND PACKAGING

- 49 McNEAL (T) and BREDER (CV). Manual, head-space, gas-solid chromatographic determination of sub-parts per trillion level of acrylonitrile in 3% acetic acid.
J. Assoc. Off. Anal. Chem. 65(1); 1982; 184-7
3% acetic acid is a solvent often used to simulate carbonated beverages when testing the possibilities of migration of plastics into foods. By combining manual head-space sampling, a detector output amplifier/filter, and vapour phase enhancement, using an ionic material, acrylonitrile could be detected at the level of a few parts per trillion. KMD

- 950 SOWDEN (RE). Gamma-radiation processing of food.
Process Biochem. 16(5); 1981; 43-5

The biochemical effects of γ -radiation on proteins, lipids and carbohydrates are described, and the potential usefulness of high and low dose γ -irradiation processing as a means of prolonging the storage life and modifying the quality of meat, fish, milk, fruit and vegetable products is discussed and reviewed. AA

FOOD ENGINEERING AND EQUIPMENT

- 951 HOLZMULLER (R). Continuous granulating dryer.
Chemie-Ingenieur-Technik. 52(12); 1980; 971-3 (German)
- 952 MOSER (R). Drying and cooling of bulk solids with a new combined dryer.
Chemie-Ingenieur-Technik. 52(12); 1980; 973-4

ENERGY IN FOOD PROCESSING

- 953 MORETH (NW). Optimal energy utilization in ovens.
Bakers' Dig. 55(5); 1981; 68-70
The subject is discussed under burner system, insulation, air movement, exhaust system and other factors which contribute to optimal utilization of energy. KAR

FOOD CHEMISTRY AND ANALYSIS

- 954 BREEDVELD (BC), Van de BOVENKAMP (P), ANDRIESSEN-BOS (J), GERMING-NOUWEN (C) and HERMUS (RJJ). Sodium and potassium contents of a number of foods.
Voeding. 41(6); 1980; 234-7
A survey has shown that, in Holland, the largest amount of sodium is found in foreign cheese, followed by sardines, salt biscuits, and ketchup. KMD
- 955 SUCKOV (VV), GRINBERG (VJA) and TOLSTOGUZOV (VB). Study of the spinnability of emulsions based on a two-phase water-casein-sodium alginate system.
Nahrung. 24(9); 1980; 893-7

- 956 PHILLIPS (MC). Protein conformation at liquid interfaces and its role in stabilizing emulsions and foams.
Food Technol. 35(1); 1981; 50-57
The article deals with the conformations of proteins at interfaces; rheological properties of protein films, protein stabilized disperse systems and the effects of protein films on emulsions and foams. KAR
- 957 AARONS (L). Effect of experimental design on assay calibration.
Analyst. 106(1269); 1981; 1249-54
- 958 FOSDICK (LE) and PIKE (RK). Polarographic determination of Kjeldahl nitrogen.
J. Assoc. Off. Anal. Chem. 65(1); 1982; 178-80
A simple and rapid method is described for determining ammonia content of a Kjeldahl digest by polarography. The digest is diluted and pipetted into a solution of formaldehyde in an acetate buffer. The hexamethylenetetramine produced by reaction between ammonia and formaldehyde is determined electrochemically at -1.04 V. Three different samples (milk, bread, and cashews) were analyzed and Kjeldahl nitrogen showed an average relative standard deviation of 3.4%; repetitive analyses of the same digest demonstrated a relative standard deviation of 1.5%. AA
- 959 LANGE (R), FRIEBE (R) and LINOW (F). On the use of the Kjeldahl wet digestion - Berthelot reaction combined method for determining nitrogen in biological materials. Part III. Studies on the consecutive and secondary reactions of the indophenol reaction (2). On the reaction course and the kinetics of the decomposition of indophenol.
Nahrung. 24(9); 1980; 907-21 (German)
- 960 GROSSPIETSCH (H) and HACHENBERG (H). Analysis of acesulfame by HPLC.
Z. Lebensmittel-Unters. Forsch. 171(1); 1980; 41-3 (German)
A new HPLC-method for the determination of acesulfame, a sweetener in beverages, foods and cosmetics is described. In contrast to other usual chromatographic methods like TLC, GC, this HPLC method is more accurate and quick. AA
- 961 BUSLIG (BS), WILSON (CW) III and SHAW (PE). High-performance liquid chromatographic separation of carboxylic acids with anion-exchange and reverse-phase columns.
J. Agric. Food Chem. 30(2); 1982; 342-5
- 962 TOYODA (M), ITO (Y), IWAIDA (M) and FUJII (M). Rapid procedure for the determination of minute quantities of residual hydrogen peroxide in food by using a sensitive oxygen electrode.
J. Agric. Food Chem. 30(2); 1982; 346-9
Of the two fractions of heat-stable ovalbumin separated from stored egg, one was a minor new protein, which was slightly acidic as compared to the fresh ovalbumin; the other fraction which was a major ovalbumin could not be distinguished in its properties, except for stability for heat denaturation, although it showed the same behaviour in electrophoresis and chromatography as the fresh ovalbumin. BSN
- 963 DANIELS (DH), WARNER (CR) and SELIM (S). Determination of polysorbate 60 in salad dressings by colorimetric and thin layer chromatographic techniques.
J. Assoc. Off. Anal. Chem. 65(1); 1982; 162-5
- 964 WORSFOLD (PJ), RUZICKA (J) and HANSEN (EH). Rapid automated enzymatic method for the determination of alcohol in blood and beverages using flow injection analysis.
Analyst. 106(1269); 1981; 1309-17
An enzymatic method for the determination of alcohol using flow injection analysis is described. Samples are suitably diluted and introduced directly into the system. Blood alcohol is analysed by the stop-flow

technique at a rate of 70-80 samples per hour and the results are compared with those from headspace gas chromatography. Alcohol in several beverages is analysed by the continuous-flow technique at a rate of up to 120 samples per hour. In both instances, the result is available in less than 30 s after injection. AA

FOOD LAWS AND REGULATIONS

- 965 DARBY (WJ). A perspective on food legislation.
Nutr. Rev. 39(11); 1981; 413-6
- 966 BULLIMORE (D). Food labelling regulations explained.
Food Flavour Ingred. Process. Pack. 4(1); 1982; 37,39,41

FOOD MICROBIOLOGY

- 967 SOBOTKA (M), VOTRUBA (J) and PROKOP (A). A two-phase oxygen uptake model of aerobic fermentations.
Biotechnol. Bioeng. 23(6); 1981; 1193-202
- 968 COWLEY (ID) and WASE (AJ). Anaerobic digestion of farm wastes: A review: Part I.
Process Biochem. 16(5); 1981; 28-33
- 969 TANAKA (H). Technological problems in cultivation of plant cells at high density.
Biotechnol. Bioeng. 23(6); 1981; 1203-18
- 970 KAWAMURA (Y), NAKANISHI (K), MATSUNO (R) and KAMIKUBO (T). Stability of immobilized α -chymotrypsin.
Biotechnol. Bioeng. 23(6); 1981; 1219-36
- 971 TREIBER (LR), GULLO (VP) and PUTTER (I). Procedure for isolation of thienamycin from fermentation broths.
Biotechnol. Bioeng. 23(6); 1981; 1255-65
- 972 JONGENELEN (FCH) and VELDHOEN (H). Fermentation of waste water in a tower fermenter.
Fette Seifen Anstrichm. 82(11); 1980; 456-9
- For the fermentation of organic materials in waste water from food industries, it can be attractive to apply instead of the activated sludge process, a process which yields single cell proteins (SCP). In contrast to the activated sludge, the SCP product possesses nutritive value and can in principle be used in animal feed. Laboratory experiments in a tower fermenter 1.2m in height have shown that the process is stable within a wide range of operating conditions. In this paper, a theoretical scaling up model for estimating the optimum dimensions and operating conditions for a pilot plant with a capacity of 100 litre waste water per hour is discussed. The model is based on the assumption that the mass transfer of oxygen from an air bubble to the liquid phase is the rate determining step of the fermentation process. The process efficiency of tower fermentation is compared with that of other biological waste water purification techniques. AA
- 973 MERCHUK (JC) and STEIN (Y). A distributed parameter model for an airlift fermentor. Effects of pressure.
Biotechnol. Bioeng. 23(6); 1981; 1309-24
- 974 VIESTURS (UE), STURMANIS (IA), KRIKIS (VV), PROKOPENKO (VD) and ERICKSON (LE). Fermentors with the power introduced by aerating gas.
Biotechnol. Bioeng. 23(6); 1981; 1171-91

- 975 TAYLOR (JB) and SWAISGOOD (HE). A unified partition coefficient theory for chromatography, immobilized enzyme kinetics and affinity chromatography. *Biotechnol. Bioeng.* 23(6); 1981; 1349-63
- 976 YAMANE (T) and SHIOTANI (T). Inter-relationship among specific rates of cell growth, substrate consumption, and metabolite formation in some simple microbial reactions producing primary metabolites. *Biotechnol. Bioeng.* 23(6); 1981; 1373-87
- 977 KURKIJARVI (K) and KORPELA (T). Construction of a stirred batch reactor for the analysis of immobilized enzymes. *Biotechnol. Bioeng.* 23(6); 1981; 1389-92
- 978 WICK (E). Controlling temperature by direct liquid-liquid heat exchange in continuous bioreactors. *Biotechnol. Bioeng.* 23(6); 1981; 1399-1400
- 979 GODFREY (T). Enzymes in food processing. *Food Flavour. Ingrid. Packag. Process.* 3(12); 1981; 13,15,21
Discusses: beneficial characteristics; enzymic starch processing; fermentation byproducts; and primary foods and ingredients. BSN
- 980 HASEBORG (E). Enzymes in flour and baking applications, especially waffle batters. *Process. Biochem.* 16(5); 1981; 16-7,19
Industrial enzymes have been used in a wide range of applications including, starch, flour and fruit processing, manufacture of alcohol, tanning, detergents and textile desizing. In this article the function of enzymes in the flour and baking industries are reviewed. AA
- 981 KOLOT (FB). Microbial carriers, strategy for selection. *Process Biochem.* 16(5); 1981; 2,4-7,9
- 982 ESENER (AA), ROELS (JA) and KOSSEN (NWF). The influence of temperature on the maximum specific growth rate of *Klebsiella pneumoniae*. *Biotechnol. Bioeng.* 23(6); 1981; 1401-5
- 983 HIEKE (E) and VOLLBRECHT (D). Metabolic activities of *Lactobacillus brevis*. Effect of pH, glucose and butane 2,3-diol. *Z. Lebensmittel-Unters. Forsch.* 171(1); 1980; 38-40

YEAST

- 984 OKADA (W), FUKUDA (H) and MORIKAWA (H). Kinetic expressions of ethanol production rate and ethanol consumption rate in Baker's yeast cultivation. *J. Ferment. Technol.* 59(2); 1981; 103-9
Ethanol was produced when available sugar concentration in the culture broth was greater than 0.28 g/l; when available sugar concentration fell below 0.28 g/l, ethanol was consumed. The specific ethanol consumption rate depended on not only the available sugar concentration but also the dimensionless concentration of inhibitory substances. KAR
- 985 RADLER (F) and SCHUTZ (H). Glycerol production of various strains of *Saccharomyces*. *Am. J. Enol. Vitic.* 33(1); 1982; 36-40
- 986 SCHWENKE (KD), SEMIONOV (A), RAAB (B), SERGEJEV (VA) and BESRUKOV (MG). Comparative studies on protein isolates from different yeasts prepared by isoelectric precipitation and ultrafiltration. *Nahrung.* 24(9); 1980; 883-91

- 987 KING (AD) Jr., PONTING (JD), SANSHUCK (DW), JACKSON (R) and MIHARA (K). Factors affecting death of yeast by sulphurdioxide. *J. Food Prot.* 44(2); 1981; 92-7

Undissociated H_2SO_3 is the only effective form of SO_2 against yeast and can be calculated from measurement of free SO_2 and pH, and the correct dissociation constants. Duration of contact, pH, concentration of SO_2 and yeast, and binding of SO_2 all influence the preservative action of SO_2 . Lower total SO_2 concentrations can be used for food preservation by optimum control of these factors. AA

- 988 HAJSLOVA (J), VELISEK (J), DAVIDEK (J) and KUBELKA (V). Flavour significant compounds in yeast autolysate Gistex X-II powder. Part 2. Neutral and basic fractions. *Nahrung.* 24(9); 1980; 875-81

Flavour properties of the individual fractions of aroma concentrate isolated from yeast autolysate, Gistex X-II powder were organoleptically evaluated, identified using coupled gas chromatography - mass spectrometry when some volatile substances in the basic and neutral fractions were obtained. Alkylpyrazines were found as the major constituent of the basic fraction. Nitrogen and oxygen containing heterocyclic compounds, phenols and carbonyls were identified in the neutral fraction. The influence of heat treatment of yeast autolysate was also investigated. AA

- 989 REED (G). Use of microbial cultures: Yeast products. *Food Technol.* 35(1); 1981; 89-94

The article discusses food preservation by yeast fermentation, nutritional aspects of fermentation, production of yeast biomass for food and potential tonic effects of fermentation products. KAR

AL GAE

- 990 BECKER (EW). Algae mass cultivation: Production and utilisation. *Process Biochem.* 16(5); 1981; 10-14, 27

MUSHROOM

- 991 MUDAHAR (GS) and BAINS (GS). Pretreatment effect on quality of dehydrated *Agaricus bisporus* mushroom. *Indian Food Packer.* 36(2); 1982; 19-27

After blanching of washed and sliced *Agaricus bisporus* mushrooms in steam or in boiling water for 5 minutes, they were immersed in (A) water, (B) NaHSO_3 (0.5%), (C) NaHSO_3 (0.5%) plus citric acid (0.25%) and (D) NaHSO_3 (0.5%) plus EDTA (0.1%) solutions, prior to drying in hot air or in the sun. Dehydration, using hot air through flow was found superior to sun-drying. Among the pretreatments, (C) produced superior dehydrated product which had satisfactory colour, shelf-life and culinary properties. From the ERH data, the monolayer moisture content (M^m) of the dried mushrooms was found to be 5.78% which approximated the finishing moisture in the dehydrated products. BSN

FOOD ADDITIVES

- 992 BIRNBAUM (H). Water activity, microbial growth and antimicrobial agents. *Baker's Dig.* 55(3); 1981; 18-21

Water activity, microbial growth and antimicrobial agents in baked goods have been discussed. Other aspects considered include water activity and osmotic pressure, microorganisms of concern to bakers; water activity and packaging, antimicrobial agents, and finally antimicrobial lipid derivatives, and their mode of action. KAR

- 993 CHAKRAVORTY (KL). Thin layer chromatographic detection of some common preservatives encountered in foods sold in India.
J. Assoc. Public Anal. 19(Pt.4); 1981; 131-3
A method has been devised for the qualitative detection of benzoic, *p*-hydroxy benzoic, salicylic and sorbic acid used as preservatives in food. The qualitative procedure is based on a TLC separation, using Silica Gel G as the adsorbent and cyclohexane: acetic acid (9:1) as the mobile solvent. The separated preservatives are identified by spraying first with 3 per cent hydrogen peroxide and then with 2 per cent ferric chloride solution after heating the plate at 95 C for 5 minutes. AA
- 994 ANON. Sealed in flavours.
Food Flavour Ingrid. Packag. Process. 3(12); 1981; 23,25
- 995 PRASAD (O) and RASTOGI (PB). Effect of feeding a commonly used non permitted food colour Orange II on the haematological values of *Mus musculus*
J. Food Sci. Technol. (India) 19(4); 1982; 150-53
Haematological studies have been carried out to investigate the effect of Orange II on male and female mice after feeding for 90 days at levels of 0.0, 0.1, 0.5 and 3.0 g/kg body weight. No change was observed in total erythrocyte count, total leucocyte count, platelet count, haemoglobin, haematocrit value, erythrocyte sedimentation rate, bleeding time, and coagulation time. However, differential leucocyte count showed decrease in the percentage of polymorphs and eosinophils and increase in the percentage of lymphocytes and monocytes suggesting the occurrence of lymphocytosis or lymphatic form of leukaemia. Heinz bodies were not observed. AA
- 996 GOLDBERG (AL) and CALVEY (RJ). Automated high performance liquid chromatographic determination of intermediates and side reaction products in FD & C Red No.3.
J. Assoc. Off. Anal. Chem. 65(1); 1982; 103-7
- 997 WATASE (M) and NISHINARI (K). Effect of alkali metal ions on the rheological properties of K-Carrageenan and agarose gels.
J. Texture Stud. 12(4); 1981; 427-45
Stress relaxation and dynamic measurements were carried out on K-carrageenan and agarose gels to examine the effect of alkali metal ions. The elastic modulus of K-carrageenan gels increase remarkably by adding alkali metal ions Li^+ , Na^+ , K^+ , Cs^+ . This was explained as follows: the electrostatic repulsion of sulphate groups in K-carrageenan gels are prevented by the shielding action of the alkali metal ions stabilizing the double helical structure of K-carrageenan gels. The increase of the modulus was in the order: $\text{Cs}^+ > \text{K}^+ > \text{Na}^+ > \text{Li}^+$. The difference between these two groups (Cs^+ , K^+) and (Na^+ , Li^+) is that the former group belongs to the structure disordering ions while the latter group belongs to the structure ordering ions. Thus, the former group prevents the repulsion of sulphate groups more directly than the latter. Agarose gel, which lacks sulphate groups, is not influenced so much by adding the alkali metal ions. AA
- 998 WATASE (M) and NISHINARI (K). Effect of de-esterification on the rheological properties of K-carrageenan gels.
J. Texture Stud. 12(4); 1981; 447-56
- 999 SHARMA (SC). Gums and hydrocolloids in oil-water emulsions.
Food Technol. 35(1); 1981; 59-67
After discussing the general properties of hydrocolloids, the author reviews the individual gums like starches, gum arabic, guar gum, carboxymethyl cellulose, carrageenans and alginates. KAR

CEREALS

- 1000 SOSULSKI (F), KRYGIER (K) and HOGGE (L). Free, esterified, and insoluble-bound phenolic acids. 3. Composition of phenolic acids in cereal and potato flours.
J. Agric. Food Chem. 39(2); 1982; 337-40
The total phenolic acid content of wheat, rice, and oat flours ranged from 71 to 87 ppm while corn flour contained 309 ppm and potato flour 410 ppm. *Cis*- and *trans*-ferulic and -*P*-coumaric acids and syringic acid were the principal phenolic compounds in the free acid or soluble ester fractions of the cereal flours. Alkaline hydrolysis of the insoluble residue of the cereals released the major proportion of phenolic acids, principally *trans*-ferulic acid. Free chlorogenic acid was the principal phenolic acid in potato flour, and a significant proportion of caffeic acid was released on hydrolysis of soluble esters. Wheat flour which had been stored for 6 months contained only 26 ppm of total phenolic acids, primarily in the bound form. AA
- 1001 BILGRAMI (KS), SINHA (KK) and PREMALATA SINGH. Prevention of aflatoxin production on some cereals and oil seeds by O-vanillin.
Curr. Sci. 51(3); 1982; 138
Seeds (25 g each) of rice, wheat, maize, groundnut and mustard were soaked in 500 ppm aqueous solution of O-vanillin for 2 hours and autoclaved. On the following day, the seeds were inoculated with 0.5 ml spore suspension of *Aspergillus parasiticus* (Strain NRRL-32 YO) and the infected seeds were incubated for 7 days at 28 ± 1 C. It was found that O-vanillin inhibited aflatoxin production by *A. parasiticus* to the extent of 85.6%, in rice, 76.25% in groundnut, 54.2% in wheat, 52.3% in maize and 51.1% in mustard. O-vanillin did not exert any pronounced effect on seed germination. The maximum inhibition was, however, 10.6% in case of mustard. MVG
- 1002 WATSON (JJ). Development of food fortification.
Cereal Food World. 26(12); 1981; 662-5
Beginnings of food fortification; fortification of cereal grain products; fortification guidelines and USDA Wheat Foods Act are the aspects covered. KAR

RICE

- 1003 VASAN (BS) and KOUSALYA (K). Use of rice germ in the common food preparations.
J. Food Sci. Technol. (India) 19(4); 1982; 161-2
Rice germ, after converting into stable milk was incorporated into coffee and tea. Rice germ (whole or defatted) as also flour was used in sweet preparations like sweet pongal, sweet ball, sweet cake and dosa. The milk could be used in tea but in coffee, rice flavour was perceptible. All the above sweet preparations made from germ were of acceptable quality. Rice germ could be added upto 20% of rice flour in dosa preparation. AA

WHEAT

- 1004 CIACCO (CF) and D'APPOLONIA (BL). Reconstitution studies with sound and sprouted wheat flour.
Cereal Chem. 59(2); 1982; 77-81
- 1005 GHIASI (K), HOSENEY (RC) and VARRIANO-MARSTON (E). Gelatinization of wheat starch. I. Excess-water systems.
Cereal Chem. 59(2); 1982; 81-5

- 1006 ELIASSEN (AC). Effect of water content on the gelatinization of wheat starch. Starch. 32(8); 1980; 270-72
- 1007 GHIASI (K), VARRIANO-MARSTON (E) and HOSENEY (RC). Gelatinization of wheat starch. II. Starch-surfactant interaction. Cereal Chem. 59(2); 1982; 86-8
- 1008 CIACCO (CF) and D'APPOLONIA (BL). Characterization of pentosans from different wheat flour classes and of their gelling capacity. Cereal Chem. 59(2); 1982; 96-9
- 1009 TABEKHIA (MM) and DONNELLY (BJ). Phytic acid in durum wheat and its milled products. Cereal Chem. 59(2); 1982; 105-7

Phytic acid content in whole wheat kernels was not significantly affected by variety or environment; however, significant differences were observed between locations. Among milled products and mill fractions, significant differences were observed between phytic acid levels due to location and variety. Phytic acid was primarily located in the mill products, bran and dust, while it was present at relatively low levels in semolina and flour. BSN

- 1010 MATHEWSON (PR), FAHRENHOLZ (CH), BOOTH (GD), POMERANZ (Y) and MILLER (BS). Results of collaborative testing using a simplified, rapid colorimetric alpha-amylase assay for evaluation of sprouted wheat. Cereal Chem. 59(2); 1982; 108-12

Collaborative testing employing simplified colorimetric α -amylase assay procedure for detection of degree of sprouting with wheat having 0-8% sprouted kernels, demonstrated, that in spite of statistically significant sampling for whole wheat samples, the different levels of sprouting damage were distinct. Collaborators within a laboratory were able to get reproducible results with the equipment available with them. However, a standardized, commercially available equipment intended to carry out the test, would certainly provide a more reliable and rapid procedure for evaluation of sprouted kernels in wheat samples. BSN

- 1011 DIKEMAN (E), POMERANZ (Y) and LAI (FS). Minerals and protein contents in hard red winter wheat. Cereal Chem. 59(2); 1982; 139-42

Twenty-five and 29 cultivars/selections of hard red winter wheat were grown at 23 locations in the Great Plains in 1973 and 1979, respectively. Equal weights of each of the 1973 cultivars/selections were composited for 10 locations and of the 1979 cultivars/selections for nine locations. In addition, equal weights of cultivars/selections from 23 locations were composited for 10 cultivars/selections for 1973 and nine cultivars/selections for 1979. The 38 composite samples were analyzed for ash, protein, P, K, Mg, Ca, Zn, Fe, Mn, and Cu. Ranges of all components were much wider for location composites (across cultivars/selections) than for cultivar/selection composites (across locations). Irrigation reduced total ash and K contents and increased Mn content. Large compositional differences were found in location composites for the two years. When components were expressed as percent of sample, eight correlation coefficients were statistically significant (in both years) for the cultivar/selection composites (ash with Zn and P; protein with P, Mg, and Zn; Zn with P and Mg; and Cu with P). Four were significant for the location composites (ash with P and Mg and protein with Ca and Mg). When mineral components were expressed as percent of ash, the significant correlations were Zn with protein, K with P, and Mn with Mg for the cultivar/selection composites and Ca with protein for the location composites. The only significant correlations irrespective of how mineral content was expressed were Zn with protein for the cultivar/selection composites and Ca with protein for the location composites. AA

- 1012 YOUNG (JC). Variability in the content and composition of alkaloids found in Canadian ergot. II. Wheat. J. Environ. Sci. Health. B16(4); 1981; 381-93
- 1013 SHELLENBERGER (JA). The baking industry and wheat quality evaluation. Baker's Dig. 55(3); 1981; 22-3

- 1014 STENVERT (NL), MOSS (R) and MURRAY (L). The role of dry vital wheat gluten in breadmaking. Part II. A microscopic method for locating dry vital gluten in doughs and determining the interaction with flour gluten and mixer type. Baker's Dig. 55(3); 1981; 27-30

The study showed that dry vital gluten is not merely dispersed throughout a dough as discrete particles, but interacts with the endogenous flour gluten and becomes incorporated into the overall gluten network. A vital gluten which develops more slowly than the endogenous gluten slows down the overall gluten development within the dough due to its interaction with the endogenous gluten. If the mixer exceeds the critical mixing speed requirement of the combined vital and endogenous gluten, thus further development occurs with extra mixing and bread quality improves. In a slow speed mixer, the critical mixing speed requirement of the combined vital and flour glutes increases with respect to time due to yeast action and results in a deterioration of bread quality with increased mixing time. i.e. 'unmixing' occurs. KAR

- 1015 FERTZDORFF (B), BECHTEL (DB) and POMERANZ (Y). Freeze-fracture ultrastructure of wheat flour ingredients, dough, and bread. Cereal Chem. 59(2); 1982; 113-20

The structures of isolated flour components of mixed doughs (containing several combinations of ingredients), of fermented doughs, and of bread crumb were examined by the freeze-fracture technique. Although the shapes of the small and large starch granules were unaltered in doughs, the gluten and the water-soluble structures appeared completely different in the complex-dough system. In general, water was distributed in three forms: 1) coating around starch granules and yeast cells, 2) droplets, and 3) large areas; all three changed with protein development. Protein development was followed from a protein network in a flour-water dough to a sheetlike protein in a complete dough (containing flour, water, yeast, sugar, salt, shortening, malt and oxidant). Both compositional and physical (dough development) effects were indicated. A transition stage between the two structures appeared after sugar was added. Fermenting a flour-water-yeast-salt dough did not affect the protein network structure, but fermenting a complete dough altered the sheetlike protein to a fine network. In bread, regular dense-structured sheets were observed. In most doughs, protein-starch interaction was clearly visible; thin "pearl chains" or thin protein strands connected starch and protein. Those interactions intensified after fermentation. In bread crumb, protein and starch were tightly connected. AA

TRITICALE

- 1016 SEHGAL (KL), SEKHON (KS), GUPTA (SK) and GILL (KS). Quality characteristics of some promising triticale strains of India. J. Food Sci. Technol. (India) 19(4); 1982; 133-6

Data on physico-chemical characteristics, rheological, bread and chapati making properties and amino acid composition of 6 triticale strains are reported. The results showed higher grain weight, grain protein, grain ash, flour protein, flour ash and diastatic activity for triticales as compared with wheat. But triticale strains had lower Pelshenke and sedimentation values and gave poor flour recoveries. The mixographic characteristics revealed poor resistance to mixing and alveographic characteristics showed poor baking strength of triticale flours. Bread produced from triticale flours had lower loaf volume and specific

volume. The chapaties produced from triticales were reddish in colour and harder in texture. The mean lysine content (g/100 g protein) was 3.13 for triticales and 2.56 for wheat. AA

MILLETS

BARLEY

- 1017 DREESE (PC) and HOSENEY (RC). Baking properties of the bran fraction from Brewer's spent grains.
Cereal Chem. 59(2); 1982; 89-91

Brewer's spent grain (BSG) was composed of barley hulls and barley pericarp (bran), which were separated after milling. The hulls, which were fibrous and abrasive in texture, were judged to be unusable as human food; all bread-making work was done with BSG bran. When BSG bran was used to replace 15% of the flour in a bread formula, water absorption increased 16%. The BSG decreased loaf volume and had a deleterious effect on crumb grain, giving an appearance similar to that of bread with no shortening. Both conditions were relieved somewhat by adding sodium stearoyl lactylate and/or increasing shortening. Studies with a resistance oven showed that bread containing BSG set at a lower temperature than did the control. AA

- 1018 BHATTY (RS). Distribution of lipids in embryo and bran-endosperm fractions of Riso 1508 and hiproly barley grains.
Cereal Chem. 59(2); 1982; 154-5

SORGHUM

- 1019 HAHN (DH), FAUBION (JM), RING (SH), DOHERTY (CA) and ROONEY (LW). Semi-automated in vitro analysis of sorghum protein availability via pronase hydrolysis.
Cereal Chem. 59(2); 1982; 132-6

Sorghum varieties with varying kernel structures were analyzed for availability of proteins. Small (100-mg) samples of ground grain were digested with a protease enzyme, pronase, and optimum pH, time, and temperature. The hydrolysate was assayed for α -amino groups by monitoring absorbance at 570 nm following reaction with ninhydrin. Pronase digestibility was determined for 196 sorghum samples, including those without a testa ($b_1b_1b_2b_2ss$), with a testa (B_1-B_2-ss), with a testa and a spreader gene (B_1-B_2-S-), and with waxy ($wxwxwx$) and nonwaxy ($W_xW_xW_x$) endosperm types. Sorghums with a testa showed significantly lower *in vitro* digestibility than sorghums without a testa. Sorghums with waxy endosperm had slightly higher digestibility than did nonwaxy sorghums. Pronase digestibilities of 11 sorghum samples were compared with those obtained by a multienzyme *in vitro* digestibility method, which grouped sorghums together in a narrow range of digestibilities. The pronase method was more sensitive, separating sorghums into groups according to observable characteristics. AA

- 1020 MATHEWSON (PR), FAHRENHOLZ (CH) and POMERANZ (Y). Applicability of the colorimetric alpha-amylase assay to evaluate sprouted sorghum.
Cereal Chem. 59(2); 1982; 166-7

MAIZE

- 1021 MILLER (BS), HUGHES (JW), ROUSSER (R) and POMERANZ (Y). Measuring the breakage susceptibility of shelled corn.
Cereal Food World. 26(2); 1981; 75-80

The study shows that a model CK₂ Stein breakage tester can measure

the breakage susceptibility of corn and can readily differentiate among corn samples with a wide range of breakage susceptibilities. However, the instrument needs rigorous maintenance regulations. Breakage increases as the temperature and/or moisture content decreases. Very large kernels (7350 g/1000 kernels) tend to break more easily than do medium sized or small kernels. KAR

- 1022 OOSTEN (BJ). Use of the Brabender amylograph to determine the gelatinization temperature of corn starch. Starch. 32(8); 1980; 272-5

Names and definitions in the field of starch analyses by gelatinization temperature are very confusing. A new name is introduced as an attempt to overcome this. It is shown that the Brabender amylograph cannot reveal the initial gelatinization temperature of corn starch suspensions. However, the apparatus is very suitable to determine the effects of electrolytes on the gelatinization temperature of starch suspensions with compositions as encountered in making starch derivatives. The measured data can be fitted to mathematical equations. AA

- 1023 SEITZ (LM), SAUER (DB) and MOHR (HE). Storage of high-moisture corn: Fungal growth and dry matter. Cereal Chem. 59(2); 1982; 100-105

Carbon dioxide, ergosterol, and aflatoxin were monitored to investigate the relationship between dry matter loss (DML) and fungal growth during storage of 150-200 g samples of rewetted and freshly harvested corn under controlled conditions at 22-27% moisture. Corn that was surface sterilized with hypochlorite solution and had little or no internal fungi lost more than 0.5%, dry matter without significant fungal growth during storage. Any samples that were invaded by fungi during storage showed relatively little change in respiratory rate compared to the change in fungal invasion indicated by ergosterol and aflatoxin contents. Results suggested that respiration of grain itself was a major contributor to DML. The amount of fungal invasion when storage time was equivalent to 0.5% DML varied considerably depending on the amount and type of kernel damage and on whether or not *Aspergillus flavus* inoculum was added. *A. flavus* growth during storage was sufficient, especially in damaged corn, to produce aflatoxin before loss of 0.5% dry matter. Results indicate that current recommendations based on DML for temporary storage of high-moisture corn should be used cautiously when conditions are favourable for fungal growth. AA

- 1024 PALMISANO (F), VISCONTI (A), BOTTALICO (A), LERARIO (P) and ZAMBONIN (PG). Differential-pulse polarography of trichothecene toxins: Detection of deoxynivalenol in corn. Analyst. 106(1266); 1981; 992-8

The polarographic behaviour of T-2 toxin and deoxynivalenol has been investigated. It was found that the electrochemical activity of trichothecene toxins is related to the presence of an α, β -unsaturated keto group and consequently the polarographic method was selective for trichothecenes having keto groups. Differential-pulse polarography gave a detection limit for a pure solution of deoxynivalenol of $0.029 \mu\text{mol l}^{-1}$ (8.6 ng ml^{-1}). This technique, coupled with an appropriate extraction procedure, was applied to the determination of deoxynivalenol in *Fusarium* infected corn. A detection limit of about 50 ng g^{-1} (for 50 g of the original sample) was estimated. AA

- 1025 THIEL (PG), MEYER (CJ) and MARASAS (WFO). Natural occurrence of moniliformin together with deoxynivalenol and zearalenone in transkeian corn. J. Agric. Food Chem. 30(2); 1982; 308-12

Mycotoxological investigations were carried out on a sample of moldy corn from Butterworth, Transkei, a district with a very high human esophageal cancer rate. Three species of *Fusarium*, i.e., *F. graminearum*, *F. sacchari* var. *Subglutinens* (= *F. moniliforme* var. *subglutinens*), and *F. verticillioides* (= *F. moniliforme*), were isolated from the moldy corn kernels. Three *Fusarium* mycotoxins, i.e., moniliformin, deoxynivalenol,

and zearalenone, were detected in the original sample of moldy kernels and at higher levels in a hand-selected subsample of visibly *Fusarium* infected kernels. This is the first indication of the natural occurrence of moniliformin. In culture, moniliformin was produced by isolates of *F. Sacchari* var. *subglutinans* from the moldy corn, zearalenone by isolates of *F. graminearum*, and deoxynivalenol by an isolate of *F. graminearum*. Two isolates of *F. verticillioides* did not produce any of these three mycotoxins in culture. AA

- 1026 LILLIHOJ (EB), MANWILLER (A), WHITAKER (TB) and ZUBER (MS). South Carolina corn yield trial samples as probes for the natural occurrence of aflatoxin in preharvest kernels. Cereal Chem. 59(2); 1982; 136-8

To explore the distribution of the aflatoxin-producing fungi and the accumulation of toxin in preharvest corn kernels, a study was conducted in the 1979 South Carolina yield trials. Thirty hybrids, 10 from each of three maturity groups (short, medium, and full season) were sampled at two locations (Blackville and Florence). A 10-lb sample of kernels was collected from each of six replications for each hybrid. The entire sample was examined for the bright greenish yellow (BGY) fluorescence that has been linked to development of the aflatoxin-producing fungi. Subsequently, the kernels were ground, blended, and assayed for aflatoxin. Over two thirds of the samples contained detectable levels of toxin, with distinct location differences. Kernels from the midseason hybrids at Florence had higher toxin levels and numbers of BGY-fluorescing particles than did other sample groups; 2% contained aflatoxin B₁ at levels above 640 ppb and had more than 320 BGY particles. Results from this location demonstrated a significant association between the number of BGY-fluorescing particles and the aflatoxin concentration in a sample. AA

- 1027 HUFF (WE) and HAGLER (WM). Evaluation of density segregation as a means to estimate the degree of aflatoxin contamination of corn. Cereal Chem. 59(2); 1982; 152-3

PULSES

- 1028 KAPLAN (L). What is the origin of the common bean? Econ. Bot. 35(2); 1981; 240-54

- 1029 SAXON (EC). Tuberous legumes: Preliminary evaluation of tropical Australian and introduced species as fuel crops. Econ. Bot. 35(2); 1981; 163-73

Native legumes and yams of the Kimberleys offer potential as fuel crops which may be grown without diverting land from the present production of fibre crops. Of the plants examined, *Dioscorea bulbifera* has the highest proportion of fermentable carbohydrate overall, while *Vigna lanceolata* has the highest proportion of fermentable carbohydrate among legumes and *Mueuna ureus* the largest tuberous roots. KAR

- 1030 GERSTENBERG (H), BELITZ (HD) and WEDER (JKP). Isolation and characterization of some proteinase inhibitors from *Phaseolus vulgaris* var. nanus. Z. Lebensmittel-Unters. Forsch. 171(1); 1980; 28-34

- 1031 UHLIG (J), PROLL (J), NOACK (R) and SCHMANDKE (H). Nutritional - physiological studies on acetylated fractions of protein from *vicia faba*. Nahrung. 24(9); 1980; 899-906 (German)

The nutritional-physiological value of an easily soluble and of a difficultly soluble fraction of protein from *vicia faba* (showing a degree of acetylation of 0%, 43% and 94% respectively) was characterized by determining the amino acid content, the enzymatic amino acid availability

and the nitrogen balance in the rat. The results from both the amino-acid analysis and the animal experiments on the biological value evidenced that the nutritional-physiological value of the easily soluble fraction of protein from *Vicia faba* is significantly lower, which is in particular attributable to its lower content of sulphur-containing amino acids. Acetylation did not reduce the nutritional-physiological value of the easily soluble fraction of protein from *Vicia faba* and impaired that of the difficult soluble fraction but slightly. From the view point of nutritional physiology, there are no objections against the use of these protein fractions as food additives. AA

- 1032 WANG (HL) and HESSELTINE (CW). Use of microbial cultures: legume and cereal products.
Food Technol. 35(1); 1981; 79-83

Use of nontoxin producing cultures in traditional fermented foods, safety of fermented foods, shelf life of fermented foods, nutritive value of fermented foods and the future of fermented legume based foods are the aspects covered. KAR

- 1033 SARWAR (G), BOTTING (HG), PEACE (RW) and NOEL (FJ). Effect of methionine supplemented legume protein products on liver fat in rats.
Nutr. Rep. Int. 24(2); 1981; 267-76

Methionine supplementation (0.2%) of 8% protein legume diets caused significant accumulation of fat in rat livers which was further elevated by adding the higher level (0.4%) of methionine, resulting in fat contents of up to 22%. Addition of threonine (0.1%) to methionine supplemented 8% protein diets exerted an inhibitory effect on fat accumulation in rat livers. KAR

FIELD PEA

- 1034 REICHERT (RD) and MacKENZIE (SL). Composition of peas (*Pisum sativum*-varying widely in protein content.
J. Agric. Food Chem. 30(2); 1982; 312-7

The composition of one variety of field peas (*Pisum sativum* L. cv. Trapper) containing 14.5-28.5% protein (dry, dehulled basis) was investigated. The variability in protein content did not appear to be related to the degree of maturation. Seventy-two percent of the difference in protein content between the highest and lowest protein content, pea was accounted for by starch, 7.9% by lipid, 8.0% by neutral detergent fiber (NDF), 6.8% by sugars, and 3.6% by ash. Starch, lipid, NDF, sucrose, and nonprotein nitrogen content, the nitrogen solubility index, and zinc content were negatively correlated with pea protein content. In addition, the amino acids threonine, cystine, glycine, alanine, methionine, and lysine (expressed as milligrams of amino acid per gram of N) were similarly correlated. Total α -galactosides, verbascose, glutamic acid, arginine, total pigments, and carotenoid pigments were positively correlated with protein content. The amino acid score, an index of nutritional quality, was negatively correlated with protein content. Xanthophylls (monohydroxy type) accounted for most of the difference in carotenoid content between the high and low protein content peas. AA

WINGED BEAN

- 1035 VAIDEHI (MP), ANNAPURNA (ML), GURURAJA RAO (MR) and UMA (CN). Food value of dehydrated root tubers of selected genotypes of winged bean (*Psophocarpus tetragonolobus* (L) DC).
J. Food Sci. Technol. (India) 19(4); 1982; 136-9

14 genotypes of winged bean tubers were evaluated for waste % during processing, yield of gratings and 3 genotypes were assessed for reconstitution. The waste from tubers ranged from 26.9 - 64.1% and the yield of dried gratings was 15.1-37.9%. Reconstitution ratio after

cooking ranged from 1:4.73 1:9.12. The range in values (%) for different constituents are: protein 9.0-17.4, ash 1.6-2.3, fibre 1.9-3.5 and carbohydrates 64.6-74.9. Reducing and non-reducing sugars were 56-144 and 16-176 mg/100 g respectively, whereas fat content was lacking in all the genotypes. The tuber flour could replace up to 25% of wheat grits in Kesaribath (a sweet preparation) and 25% of wheat flour in cookies. Substitution beyond this level imparted rooty flavour to the product. KAR

OILSEEDS AND NUTS

- 1036 KRYGIER (K), SOSULSKI (F) and HOGGE (L). Free, esterified and insoluble-bound phenolic acids. I. Extraction and purification procedure. J. Agric. Food Chem. 30(2); 1982; 330-34

A rapid procedure for the accurate quantitation of free, esterified, and insoluble-bound phenolic acids in oilseeds is described. Phenolic acids and esters were extracted with methanol-acetone-water; the esterified and bound phenolic aglycons were released by alkaline hydrolysis. The extracts and hydrolysates were purified by washing with hexane and extraction in diethyl ether-ethyl acetate before silylation and gas-liquid chromatography. AA

ALMOND

- 1037 SCHADE (JE), KING (AD) Jr., MACKEY (BE), HALBROOK (WU) and FULLER (G). Sampling diced almonds for aflatoxin. J. Am. Oil Chem. Soc. 58(9); 1981; 852-7

GROUNDNUT

- 1038 SINGLETON (JA) and PATTEE (HE). Computation of conversion factors to determine the phospholipid content in peanut oils. J. Am. Oil Chem. Soc. 58(9); 1981; 873-5

A conversion factor of 23.6, 24.8, 26.6, 22.2, and 24.4 was found for phosphatidylethanolamine, phosphatidylcholine, phosphatidylinositol, phosphatidic acid, and total phospholipid, respectively. These factors also were used to convert µg of phosphorus into µg of phospholipid. AA

SOYABEAN

- 1039 HYMOWITZ (T) and NEWELL (CA). Taxonomy of the genus glycine, domestication and uses of soyabeans. Econ. Bot. 35(3); 1981; 272-88

The traditional uses of fermented and non-fermented soyabeans in the East as well as the high-technology developed and uses of soyabeans in the West are summarised under the uses of soyabeans. KAR

- 1040 VIJAY PRATAP, SINGH (BPN) and MAHARAJ NARAIN. Equilibrium moisture content of some flours. J. Food Sci. Technol. (India) 19(4); 1982; 153-8

Equilibrium moisture content (EMC) of defatted soyflour, full fat uncooked soy flour, Bengal gram flour, semolina and wheat flour was studied at 20, 30, 40 and 50 C and at 30-90% RH range. Caking was observed in all materials at 80 to 90% RH. At 20 and 30 C and at 90% RH mold growth was observed on all the products except semolina. Defatted soy flour absorbed more moisture than full-fat (20% fat) soy flour. The EMC of different flours showed that semolina has the highest sorptive capacity followed by wheat flour, Bengal gram flour and soy flour in that order. Latent heat of vapourization of the adsorbed

moisture is about the same for all products. Amongst the standard isotherm equations tested, Henderson's equation gave the best fit to the data. A more compact representation of the equilibrium moisture data is provided by a new equation proposed which is based on Othmer plot; this gave lower prediction errors than those obtained using Henderson's equation. The equation is $M = F (\ln(rh)/\ln(Ps/\xi))$, where M is the product moisture, Ps is the partial pressure of water in atmospheres. Curves have been drawn for all the flours under test following the equation. KAR

- 1041 ELDRIGE (AC). Determination of isoflavones in soyabean flours, protein concentrates, and isolates.
J. Agric. Food Chem. 30(2); 1982; 353-5
- 1042 Van RAAIJ (JMA), ENGELN (MR) and de VRIES (JHM). Effect of casein vs soya protein on the serum cholesterol level of healthy human subjects.
Voeding. 41(7); 1980; 260-4
The results of blood analysis suggest that, for healthy young people, there is no difference between casein and soya protein in their effects on serum cholesterol, in short-term dietary experiments. KMD
- 1043 TERPSTRA (AHM), HARKES (L), SANCHEZ- MUNIZ (FJ) and Van der VEEN (FH). Changes in the lipoprotein pattern of rabbits on semi-synthetic rations containing soya protein and casein.
Voeding. 41(7); 1980; 265-67
Proteins from different sources have markedly different effects on the serum cholesterol content in rabbits, pigs and rats, but have very little or no influence on the serum cholesterol content of chickens and humans. Thus, cholesterol and lipoprotein metabolism is regulated in different ways in the different species of animals. Hence, results of animal experiments cannot always be extrapolated to man. KMD
- 1044 VIJAYALAKSHMI (K) and VAIDEHI (MP). Evaluation of tofu and its products prepared from soymilk and combination with sunflower seed milk and skim milk.
J. Food Sci. Technol. (India) 19(4); 1982; 139-42
Tofu from soymilk alone (100%) or in combination with sunflower seed milk (40 and 20%) and skim milk (40 and 20%) were prepared as a ready-to-use and as a base for various Indian dishes. Sensory evaluation of the preparations indicated that tofu of soy alone and soy + skim milk (60+40) were acceptable whereas tofu of soy + sunflower seed milk (60+40) and soy + sunflower seed milk + skim milk (60+20+20) were unacceptable. Burfi (sweet preparation) and Pakoda (savory snack preparation) prepared from the accepted tofu were acceptable. Cost evaluation for soy, tofu and soy + skim milk tofu (60+40) has been done. KAR

JOJOBA OIL

- 1045 SHANI (A). Functionalization at the double bond region of jojoba oil: I. Bromine derivatives.
J. Am. Oil Chem. Soc. 58(9); 1981; 845-50
- 1046 UTZ (WJ), O'CONNELL (PL), STOREY (R) and BOWER (NW). Nutritional evaluation of the jojoba plant: Elemental analysis of the seed meal.
J. Agric. Food Chem. 30(2); 1982; 392-4
Data on N, P, S, Cl, Na, K, Ca, Mg, Fe and other trace elements present in seeds of jojoba, (*Schneides chinensis* (Link) schneides) from different geographic sources, have been reported and discussed. BSN

COTTONSEED

- 1047 BHAT (JG) and INDIRA KUTTY (KN). Cottonseed oil and groundnut oil mixtures as cooking media. J. Food Sci. Technol. (India). 19(4); 1982; 166-8
 Indian type savoury snacks (Bhaji, Vadai, Sevai and Murukku) were prepared by frying in edible refined cottonseed oil (C), non-refined groundnut oil (G) and their mixtures (75% G + 25% C; 50% G + 50% C; 75% C + 75% G). The products were evaluated for colour, flavour, crispness, adherence of oil, and taste, by a panel of 10 judges. The overall results indicated that although cottonseed oil alone could be used for frying Bhaji and Murukku, still a mixture of 50% of each of G and C oil would give a product which is comparable to G fried product and will be acceptable with respect of all the qualities. This will help in overcoming the oil shortage currently faced by India. AA
- 1048 GAD (TE) and EL-ZALAKI (EM). Effect of various pressure cooking conditions on gossypol content of cottonseed meal and oil. Fette Seifen Anstrichm. 82(11); 1980; 450-3
 Cottonseed meals were conditioned to four different levels of moisture and cooked at three different levels of pressure for two different cooking periods. The decrease (91.1%) of the free gossypol content in the meals depended mainly upon the moisture content of the conditioned meals and the cooking temperature rather than on the cooking period. The decrease of total gossypol content was more pronounced by the increment of both the cooking period and the level of moisture content to which the meal was conditioned. Generally, moist pressure cooking decreased the protein content of meals by 8% and the free fatty acids of oil were decreased to 1.12-1.18%. Laboratory produced meals and oils were compared with those produced in the factory. AA

SUNFLOWER OIL

- 1049 SCHUSTER (W), KUBLER (I) and MARQUARD (R). The variability of protein and oil content as well as the fatty acid composition of single sunflower seeds within varieties and lines. Fette Seifen Anstrichm. 82(11); 1980; 443-9 (German)
 From eight sunflower varieties 100 achenes were selected. Protein and oil content, as well as the share of hull, of each achenes was investigated. The fatty acid composition of some seeds with high or low oil content was investigated. The quality of seeds of open pollinated varieties from several countries was found to be distinctly genetically different. By means of selfings of the variety "Vniimk" genetical differences for the linoleic acid could be shown. AA
- 1050 HOSTMARK (AT), SPYDEVOLD (OS), EILERTSEN (E), LYSTAD (E), KRISTENSEN (E) and BAY (IG). Sunflower oil feeding increases HDL₂/HDL₃ ratio in rats. Nutr. Rep. Int. 24(2); 1981; 371-7
 Two groups of male rats were fed for 5 months a purified diet containing either 10% coconut oil (CO) or sunflower oil (SO). Rats fed SO had a lower plasma level of free cholesterol (FC), cholesterol ester (CE) and triglycerides (TG) than rats fed CO. Rats in the SO group had a higher relative amount of all components in HDL_{2a} (high density lipoprotein, d = 1.100 - 1.125 g/ml), but a much lower amount in HDL₃ (d = 1.125 - 1.200 g/ml) than those of the CO group. Thus compared with CO the SO diet effected a shift of components from HDL₃ to HDL_{2a} thereby greatly enhancing the HDL_{2a}/HDL₃ ratio. KAR

CHEURI

- 1051 JHA (JS). Spectrophotometric studies of cheuri (*Madhuca butyracea*) fat and ghee mixtures. I.
J. Am. Oil Chem. Soc. 58(9); 1981; 843-5

Visible spectra of cheuri (*Madhuca butyracea*) fat, ghee (clarified butterfat) and 10 of their mixtures are reported. Pure ghee showed no absorption band in the visible range whereas the cheuri fat samples showed an absorption band with maxima between 640 and 680 nm. Even 5% cheuri fat content in ghee had a small absorption in this range. An index R (maximal absorbance of band between 640 and 680 nm - A_{700}) was found suitable for estimating the amount of cheuri fat in ghee samples. AA

MUSTARD

- 1052 DATTA (SK). Determination of rapeseed oil in mustard oil from the critical solution temperature.
J. Assoc. Public Anal. 19(Pt.4); 1981; 127-9

Both mustard oil and rapeseed oil mixed with an equal volume of ethylene glycol monomethyl ether, exhibit a characteristic critical solution temperature. Mustard oil adulterated with rapeseed oil shows a decrease in the critical solution temperature. This decrease in critical solution temperature is linearly related to the amount of the adulterant. This provides a very simple and rapid method for the determination of rapeseed oil in mustard oil and requires only 3 ml of the oil. AA

NIGER

- 1053 NASIRULLAH, MALLIKA (T), RAJALAKSHMI (S), PASHUPATHI (KS), ANKAIAH (KN), VIBHAKAR (S), KRISHNAMURTHY (MN), NAGARAJA (KV) and KAPUR (OP). Studies on niger (*Guizotia abyssinica*) seed oil.
J. Food Sci. Technol. (India) 19(4); 1982; 147-9

9 niger seed samples collected from Maharashtra and Gujarat (India) were analysed. The content of oil ranged from 30.0 to 32.4% and protein from 26.0 to 30.6%. The range of values for other characteristics are: iodine value, 112.8-129.0; saponification value, 187.0-195.0; free fatty acid, 0.2-2.0%; butyro-refractometer reading, 59.5-62.2; refractive index 1.4655-1.4673, Bellier turbidity temperature 24.5-27.8 C and unsaponifiable matter; 0.5 to 1.0%. Oil samples were *trans*-esterified and fatty acid composition determined by GLC. The saturated fatty acids present are: palmitic 5.8-13.0%; stearic, 5.0-7.5% and arachidic 0.2-1.0%; oleic (13.4-39.3%) and linoleic (45.4-65.8%) constituted the major fatty acids. UV spectrum of methanol solution of niger seed oil showed three peaks at 256, 260 and 267 nm; the possibility of having any conjugation has been ruled out by the UV spectra of methyl esters. KAR

RAPESEED

- 1054 KRYGIER (K), SOSULSKI (F) and HOGGE (L). Free esterified, and insoluble-bound phenolic acids. 2. Composition of phenolic acids in rapeseed flour and hulls.
J. Agric. Food Chem. 30(2); 1982; 334-6

The composition of free, esterified, and insoluble-bound phenolic acids in rapeseed cultivars was determined by gas-liquid chromatography and mass spectrometry. Rapeseed hulls contained no free phenolic acids and relatively low levels of soluble ester and bound phenolics. Sinapic acid was the principal phenolic acid released by hydrolysis of the soluble esters in the hulls while protocatechuic acid was the major phenolic acid in the residues. The flours contained

6-98 mg/100 g of free phenolic acids, 768-1196 mg/100 g of phenolic acids from hydrolyzed esters, and no phenolic acids in the residues. Sinapic acid represented a high proportion of the free phenolic acids and 99% of acids released from esters in the flours. Minor phenolic acids included *p*-hydroxybenzoic, vanillic, gentisic, protocatechuic, syringic, *p*-coumaric, and ferulic acids in the various fractions and cultivars. AA

TUBERS AND VEGETABLES

- 1055 LOX (F) and OKABE (A). Comparison of nitrite and nitrate determination in vegetables; Suitability for accurate and automated measurements. J. Assoc. Off. Anal. Chem. 65(1); 1982; 157-61
- 1056 CZAJA (ATH). Starch granules in vegetation. Microscopic and submicroscopic morphology and evolution. Starch. 32(8); 1980; 253-7
- 1057 LOH (J) and BREENE (WM). The thermal fracturability loss of edible plant tissue: Pattern and within-species variation. J. Texture Stud. 12(4); 1981; 457-71
- 1058 DALE (BE) and MATSUOKA (M). Protein recovery from leafy crop residues during biomass refining. Biotechnol. Bioeng. 23(6); 1981; 1417-20
- 1059 AFOLABI (AO), OKE (OL) and UMOH (IB). Preliminary studies on the nutritive value of some cereal-like grains. Nutr. Rep. Int. 24(2); 1981; 389-94
Amaranthus caudatus, *Celestia argentea* and *Cerchorus olitorius* contain 11-14% protein of good quality with a lysine content of 4.0-5.5 g/16 g N. Methionine contents were marginal (1.6-1.9 g/gN). All seeds are highly digestible (TD 81-93). All the rats fed *Amaranthus* lost weight due to high tannin content. (0.25%). KAR
- 1060 FLEMING(HP) and McFEETERS (RF). Use of microbial cultures: Vegetable products. Food Technol. 35(1); 1981; 84-8
 Fermentation process in vegetables, types of bacteria used for inoculation, shelf life of fermented products, safety of fermented vegetables, nutritive value and further research needed are the aspects covered in the review. KAR

ONION

- 1061 VATSALA (TM) and MEGHA SINGH. Effects of onion in induced atherosclerosis in rabbits. II. Reduction of lipid levels in the eye. Curr. Sci. 51(5); 1982; 230-32
 The effect of onion extract (from 20 g fresh onion) which has been reported to significantly reduce the aortic lesions and lipid levels and maintain the normal shape of erythrocytes at the varied levels of plasma constituents, on the lipid levels in the eye of rabbits fed with hypercholesterolemic diet (carrot, cabbage and greens (normal diet) + 0.5% cholesterol) was determined. The results showed that the total lipids, cholesterol and phospholipids were significantly higher in animals fed cholesterol diet than in animals fed cholesterol and onion extract diet. The lipid levels in the latter group were comparable to lipid levels of the control group. MVG

CARROT

- 1062 YATES (SG) and ENGLAND (RE). Isolation and analysis of carrot constituents: Myristicin, falcarinol and falcarindiol. J. Agric. Food Chem. 30(2); 1982; 317-20

Carrot roots are blended with dichloromethane in the presence of an antioxidant, and the resulting suspension is centrifuged. An aliquot of the clear extract is removed, concentrated, dissolved in hexane, and fractionated by gravity-flow adsorption chromatography on silica gel (70-325 mesh). Carotenoid pigments are removed with hexane, and myristicin (1-allyl-3, 4-methylenedioxy-5-methoxybenzene), falcarinol (3-hydroxyheptadeca-1,9-diene-4,6-diyne), and falcarindiol (3,8-dihydroxyheptadeca-1,9-diene-4,6-diyne) are eluted with 45:55 ethyl ether-hexane. After a 20-fold concentration, these compounds are analyzed directly by gas-liquid chromatography (GLC) on SE-52 and OV-17 columns (80-250 C at 4 C/min.) with methyl palmitate as an internal standard. Recoveries of added myristicin, falcarinol, or falcarindiol (15 ppm) were about 95%. Analyses by this method support previous estimates of falcarinol levels in carrots (40 ppm). Falcarindiol, however, was found in higher concentrations (80 ppm) than reported previously (6 ppm) for whole carrots (Bentley et al., 1969). AA

- 1063 VIJAY SETHI and ANAND (JC). Studies on the preparation, quality and storage of intermediate moisture (IM) carrot preserve. J. Food Sci. Technol. (India). 19(4); 1982; 168-71

Intermediate moisture (IM) carrot slices were prepared by soaking in a solution containing sugar, glycerol, water, acid and preservatives. The carrot to solution ratio was 1:2. The product was packed in (i) glass (1 lb) and (ii) HDPE bottles (350 ml), (iii) 150 gauge poly propylene pouch, (iv) 200 gauge polyethylene pouch, and stored at 1-3 C, room temperatures (25-35 C) and at 37-40 C for 6 months. The product had good colour, flavour and texture and could be consumed as such without any rehydration. Slices treated with 500 ppm of SO₂ and 0.45% potassium sorbate were free from microbiological spoilage at 39.2% moisture level. (i) showed better retention of β -carotene, (about 45% retention at room temperature and high temperature) during 2 months storage. At low temperatures, the product was acceptable after 6 months in (i) with 40% β -carotene retention. Plastic bottles retained flavour and taste and were free from contamination for 6 months. However, the product became discoloured after 2 months at room and high temperatures. But at low temperatures, the product kept well for 6 months. KAR

POTATO

- 1064 MOUNTAIN (A). Potato processing in the Netherlands. Food Flavour. Ingrid. Packag. Process. 3(12); 1982; 29-31,33

Discusses: 150 potato varieties; external quality; exports; potato chips; potato crisps; potato flakes; potato granules; peeled potatoes; and latest trends. BSN

- 1065 RAMA (MV) and NARASIMHAM (P). A comparative study on the effect of gibberellic acid, ethrel and ethylene chloride on potato (*Solanum tuberosum* Linn.) sprouting. J. Food Sci. Technol. (India) 19(4); 1982; 144-7

Breaking of dormancy and uniform sprouting of potato buds is necessary, when heat treatment is resorted to for the control of sprouting in potatoes during storage. Potato tubers were treated with gibberellic acid (GA), ethrel (E) and ethylene chloride (EC) at 10, 100, and 1000 ppm concentration, for 10 minutes to induce sprouting. The observation made for 4 weeks showed that E at 10 ppm and GA at 100 and 1000 ppm induced significant sprouting whereas sprouts per tuber was maximum in those treated with E at 10 and GA at 100 ppm. At the

end of 4 week period, sprout yield was significantly more than the control at 100 and 1000 ppm of GA, 10 ppm of ethrel and 100 ppm of EC. KAR

- 1066 STEVENS (ER) and DAVIS (JE). Potential exposure of workers during seed potato treatment with captan. Bull. Environ. Contam. Toxicol. 26(5); 1981; 681-8
- 1067 COXON (DT) and JONES (PG). A rapid screening method for the estimation of total glycoalkaloids in potato tubers. J. Sci. Food Agric. 32(4); 1981; 366-70
- 1068 HOLM (F). A new system for the production of starch and protein from potato. Starch. 32(8); 1980; 258-62

This article describes a technical system for the manufacture of starch, protein and fiber concentrates from potatoes without addition of process water. Because of a gentle drying, the excellent physical characteristics of the potato protein are maintained and make it applicable in foods. Calculations indicate a favourable economy using existing spray drying plants, which are idle in the potato season. Spray drying results in an increased energy consumption, but this seems to be balanced by a larger product yield/t potatoes, the saving of waste water installations and the excellent physical and nutritional properties of the protein. AA

SWEET POTATO

- 1069 AZHAR (A) and HAMDY (MK). Alcohol fermentation of sweet potato. Membrane reactor in enzymatic hydrolysis. Biotechnol. Bioeng. 23(6); 1981; 1297-1307
- 1070 PADMAJA (G) and RAJAMMA (P). Biochemical changes due to weevil (*Cylas formicarius* Fab.) feeding on sweet potato. J. Food Sci. Technol. (India) 19(4); 1982; 162-3

Biochemical changes (DM, total phenols, protein, starch, sugars and lipids) in sweet potato due to feeding by the adults and larvae of *Cylas formicarius* (Curculionidae: Coleoptera) over a period of 21 days was investigated. After 7 days of feeding, total phenols increased in adult fed (0.68%) and larve fed (0.70%) tubers compared to control (0.43%). After 14 days feeding the total phenolic values were 1.88, 2.43 and 0.95% in adult + larve fed, larve fed and non-fed tubers respectively. Increase in protein was also observed in 14 days fed samples, but not in control. KAR

CABBAGE

- 1071 BEZUIDENHOUT (FJ) and Van DYK (LP). A comparison of chromatographic and spectrophotometric methods for the determination of carbaryl residues in cabbages. Bull. Environ. Contam. Toxicol. 26(6); 1981; 789-94
- Spectrophotometric method of IWATA *et. al* (1979) was found to be the best among the methods examined for routine analysis of carbaryl residues present in cabbage. BSN

CAULIFLOWER

- 1072 RAINA (BL), PRUTHI (JS), KALRA (CL), TEOTIA (MS) and JARNAIL SINGH. Influence of variety on quality of processed cauliflower. Indian Food Packer. 36(2); 1982; 7-15

Five varieties of cauliflower ((i) S-35, (ii) S-35A, (iii) S-26, (iv) Giant Snow Ball and (v) improved Japanese varieties) obtained from the Punjab Agricultural University, India were examined for physicochemical characteristics, canning quality and dehydration and rehydration qualities. (i) and (ii) retained better texture and colour than others and were found suitable for canning. Addition of ascorbic acid (at 0.12%) to the covering brine during canning slightly improved the retention of colour and texture in canned packs. Ascorbic acid losses ranged from 40 to 50% during six months and from 66.4-80.0% during 12 month's storage 13-38 C. Dehydrated (iv) reconstituted to original shape reasonably well on rehydration and showed good acceptance scores (rehydration coefficient 0.56). (v) with a rehydration coefficient of 0.55 was rated the next best for dehydration. BSN

TOMATO

- 1073 RAO (MA), BOURNE (MC) and COOLEY (HJ). Flow properties of tomato concentrates.

J. Texture Stud. 12(4); 1981; 521-38

The flow properties of over seventy concentrates made from four cultivars of tomatoes were determined with a concentric cylinder viscometer. The apparent viscosity (100 s^{-1} , 25 C) of the concentrates of each variety was proportional to the 2.5 power of the concentration (% total solids). The apparent viscosity of the Nova cultivar obeyed the Arrhenius temperature relationship; the activation energy for the concentrates was $2.3 \pm 0.3 \text{ kcal/mole}$. The simple power law and the Casson model described satisfactorily the flow data of the concentrates, but the power law gave higher correlation coefficients. The Herschel-Bulkley model with the Casson yield stress was also satisfactory, but the correlation coefficients were lower than for the simple power law. The consistency index of the power law model also showed a power dependence on the concentration. The natural logarithm of the yield stress and the concentration could be correlated by a quadratic equation. AA

- 1074 BEERH (OP). Detection of adulteration in tomato ketchup by histological characteristics and staining techniques.

Indian Food Packer. 36(2); 1982; 28-31

Detection of adulteration in tomato ketchup prepared with commonly used adulterants like pumpkin, ash gourd, sweet potato, carrot, papaya and apple pomace was carried out using histological characteristics and staining techniques. Camera Lucida drawings showed that pumpkin, sweet potato and carrot could be detected by their cell structures which are distinctly different than those of tomatoes. Staining with iodine further confirmed the presence of these adulterants. Presence of apple pulp could be detected by staining with methylene blue. Detection of ash gourd and papaya, was, however, not possible with these techniques. BSN

OKRA

- 1075 KALRA (CL), PRUTHI (JS), TEOTIA (MS), RAINA (BL), SHARMA (BR). and NANDPURI (KS). Influence of variety, size, grade and number of ridges of okra on the canned okra (*Hibiscus esculentus* L.).

Indian Food Packer. 36(2); 1982; 53-62

13 new varieties of okra developed by the Punjab Agricultural University, Ludhiana, India, were studied for their physico-chemical characteristics. 6 varieties were assessed for their suitability for processing. All the varieties were found to be poor source of ascorbic acid and a fair source of protein. Protein content appeared to be correlated with length of pod. Crude fibre and protein content increased with the size of the pod, size grading of okra prior to canning yielded much superior product of uniform quality. The varieties

Vashali Vadhu was found to be best for canning followed by L-Sel-1 and R1 P2 PS. The variety Pusa Sawani, Sel-2 and PS (SLG x 7 diary) were found to be unsatisfactory for canning due to their mashiness, high mucilage content and less appealing organoleptic qualities. BSN

CHILLI

- 1076 POKHARKAR (DS) and DETHE (MD). Gas-liquid chromatographic studies on residues of endosulphan on chilli fruits.
J. Environ. Sci. Health. B16(4); 1981; 439-51

PLANTAIN

- 1077 ALVAREZ (RJ), KOBURGER (JA) and APPLIEDORF (H). Nutritional and microbial changes during production of tostones (fried plantains).
J. Food Prot. 44(1); 1981; 55-8,61

Tostones are prepared in Florida by peeling and cutting the plantains into slices; soaking slices in salt brine; frying, drying, and flattening the slices; and refrying them until they are golden brown. The percentage of most nutrients increased because of loss of moisture and uptake of fat; a decrease was observed only in K and Fe. Changes in water activity and pH were not significantly pronounced. *Bacillus* and *Penicillium* species were the only organisms isolated from laboratory-prepared samples. The finished product contained 48% carbohydrate, 26.5% moisture, 21.5% fat, 2.5% protein, 1.0% ash, 0.5% crude fibre, and 395 kcal/100g. KMD

CUCUMBER

- 1078 DAVIS (DW), ACHAHBOUN (M), SHEHATA (MA) and BREENE (WM). Influence of growing environment and storage duration on quality of fresh-pack cucumber pickles.
J. Texture Stud. 12(4); 1981; 507-20

FRUITS

- 1079 GEETHA and SHIVA LEELA (HB). Ascorbic acid content of commercial fruit and vegetable products.
Indian Food Packer. 36(2); 1982; 64-6

Ascorbic acid content of 11 processed fruit products (i) lemon crush, (ii) lemon pickle, (iii) mixed vegetable pickle, (iv) mango pickle, (v) mixed fruit jam, (vi) orange squash, (vii) orange marmalade, (viii) pineapple crush, (ix) pineapple slice, (x) tomato juice and (xi) tomato ketchup were determined. Ascorbic acid content ranged from 5.84 mg in (iv) to 34.53 mg in (vi). Max. loss occurred in products subjected to continuous, boiling, stirring, etc. It was found that a single serving of (vi), (viii), (x), (ix), (i), (iii) provides 8.63, 6.11, 3.34, 3.09, 3.02 and 2.99 mg of ascorbic acid to the consumer. BSN

- 1080 SHAW (PE) and WILSON (CW). III. Ascorbic acid content of some tropical fruit products determined by high-performance liquid chromatography.
J. Agric. Food Chem. 30(2); 1982; 394-6

HPLC analysis for presence of ascorbic acid in guava, mango, papaya and orange products revealed that many of these products contained relatively low levels of ascorbic acid than that present in fresh fruit. Methanol 6% metaphosphoric acid extraction procedure completely extracted ascorbic acid from the sample. Ascorbic acid was completely absent in canned orange shells, possibly due to its removal during the debittering process. BSN

BLUEBERRY

- 1081 GUINIVAN (RA), THOMPSON (NP) and WHEELER (WB). Derivatization and cleanup improvements in determination of residues of glyphosate and aminomethylphosphonic acid in blueberries.
J. Assoc. Off. Anal. Chem. 65(1); 1982; 35-9

STRAWBERRY

- 1082 REYES (FGR), WROLSTAD (RE) and CORNWELL (CJ). Comparison of enzymic, gas-liquid chromatographic, and high performance liquid chromatographic methods for determining sugars and organic acids in strawberries at three stages of maturity.

J. Assoc. Off. Anal. Chem. 65(1); 1982; 126-33

Free sugars and major nonvolatile organic acids present in strawberries at 3 degrees of ripeness were determined by 3 analytical methods; enzymic, gas-liquid chromatographic, and high performance liquid chromatographic. Results showed that variability in sugar composition due to both degree of ripeness and method of analysis was greater for sucrose than for glucose and fructose. Sucrose was almost completely hydrolyzed in the overripe fruit. Acid results showed that there was little variation in citric acid levels due to ripeness or method of analysis; malic acid, however, decreased greatly in overripe fruit. Malic acid also showed high variability due to method of analysis. The glucose:fructose ratios for the underripe, ripe, and overripe fruit were 0.86, 0.92, and 0.60, respectively. The citric:malic ratios were 1.58, 2.39, and 14.86 for the underripe, ripe, and overripe stages, respectively. AA

PINEAPPLE

- 1083 MEHTA (GL), TOMAR (MC) and GAWAR (BS). Studies on dehydration of pineapple in Uttar Pradesh (*Ananas comosus*, Linn/MERR).
Indian Food Packer. 36(2); 1982; 35-40

Pineapple slices were dehydrated after (1) sulphiting with 500 ppm SO₂ or blanching in 40, 50, 60 and 70 Brix. Blanching was done for 3 minutes in equal amounts of sugar syrup with 0.35% citric acid and 0.1% KMS added cooled to room temperatures and equilibrated for 20 hours. It was dried in a cross flow drier at 60 C for 6-8 hours and packed in 250 gauge polythene bags, heat sealed, placed inside friction top tin containers and stored at RT. Based on chemical composition, reconstitution characteristics and organoleptic scores, dehydrated product prepared from slices blanched in equal amounts of 50 brix sugar syrup gave the best product. BSN

SAPOTA

- 1084 DURRANI (SM), PATIL (VK), KADAM (BA) and KHEDKAR (DM). Effect of N, P and K on the physico-chemical characteristics of sapota (*Achras sapota* Linn.).

J. Food Sci. Technol. (India) 19(4); 1982; 164-5

Fertilizers were applied at the level of 200 and 400 g N, 100 and 200 g each of P₂O₅ and K₂O/tree/yr. Application of fertilizers at the rate of 400 g N, 200 g each of P₂O₅ and K₂O/tree/yr significantly increased the fruit weight, pulp weight, total and reducing sugars. K has favourable effect on peel and seed weight. KAR

GRAPE

- 1085 FAMUYIWA (O) and OUGH (CS). Grape pomace: Possibilities as animal feed.

Am. J. Enol. Vitic. 33(1); 1982; 44-6

Dry matter digestibilities of several grape pomace varieties are compared in cow, sheep and goat by *in vitro* technique. Values obtained (26%-39%) are low compared to alfalfa hay (69%) or sudan-grass (65%). Total phenols and tannic acid equivalent are determined and influence on digestibility is evaluated. Pre-extraction with cold or warm water reduces the total phenol level, but also removes water soluble nutrients.

AA

CITRUS

- 1086 IWATA (Y), KNAACK (JB), CARMAN (GE), DUSCH (ME) and GUNTHER (FA). Fruit residue data and worker re-entry research for chlorthiophos applied to California citrus trees.

J. Agric. Food Chem. 30(2); 1982; 215-22

GRAPEFRUIT

- 1087 STEIN (ER), CARTER (WW) and MURRAY (AT). A modification of imazalil residue analysis in treated grapefruit.

J. Environ. Sci. Health B16(4); 1981; 427-37

Residues of imazalil, 1-(2-(2,4-dichlorophenyl)-2-(2-propenyloxy) ethyl)-1H-imidazole, a fungicide that prevents decay of citrus, were determined in treated grapefruit. The method consists of a simplified heptane-isoamyl extraction solvent, acid-base clean-up, and direct gas chromatographic analysis with electron-capture detection. AA

LEMON

- 1088 PRAGER (MJ) and MISKIEWICZ (MA). Gas chromatographic-mass spectrometric analysis, identification and detection of adulteration of natural and concentrated lemon oils.

J. Assoc. Off. Anal. Chem. 65(1); 1982; 166-71

Lemon oils were characterized by quantitative glass capillary gas chromatography. Components present to the extent of more than 0.05% were measured and identified by mass spectrometry. In expressed lemon oils, monoterpenes and geranial were the only components present at concentrations of 1.0% or more. In concentrated lemon oils, β -caryophyllene, linalool, neral, α -terpineol, neryl acetate, and geranyl acetate were present in some samples in amounts of 1% or more. Adulteration was detected by component concentrations outside characteristic ranges for oils judged to be authentic. AA

SWEET ORANGE

- 1089 BHULLAR (JS). Extending post-harvest life of blood red (*Citrus sinensis* Osbeck) fruits.

Indian Food Packer. 36(2); 1982; 44-8

Blood red fruits of *Citrus sinensis* were treated for 1 minute with wax emulsion (6%), Benlate (125 & 250 ppm), 2,4-D (50, 10 ppm), 2,4-T (100 & 150 ppm), Carbaryl (1000 & 2000 ppm), CCC (1000 & 2000 ppm) and MH (500 & 1000 ppm), packed in perforated polythene bags (100 gauge) and were stored for 50 days at 16-27.5 C and at 60-72% RH. The fruits were examined after 27, 35 and 50 days for physiological loss in weight (PLW)%, fruit rot, juice content, TSS, sugars, acidity and vitamin C contents. It was found that blood red fruits can be economically stored

at room temperature upto 35 days by treating with Benlate (125 ppm) which showed fruit rot (nil) and PLW (4.32%). Minimum PLW of 3.14% was observed in 6% wax emulsion coated fruits. The TSS, the total and reducing sugars increased with the prolongation of storage period, whereas acidity decreased. The results indicate that the Blood red fruits can be stored at room temperature upto 35 days when treated either with 125 ppm of Benlate or by coating with 6% wax emulsion. BSN

PLUM

- 1090 ISMAIL (HMM), WILLIAMS (AA) and TUCKNOTT (OG). The flavour components of plum. An examination of the aroma components present in a distillate obtained from fermented plum juice.

Z. Lebensmittel-Unters. Forsch. 171(1); 1980; 24-7

Gas chromatographic and mass spectrometric analysis of the volatiles present in a distillate from fermented plum juice led to the identification of 54 components comprising 11 hydroxy compounds, 1 acid, 30 esters, 4 carbonyls, 3 lactones and 5 acetals. Thirty of these compounds have not previously been reported in fermented plum products. Benzaldehyde, linalool, methyl cinnamate and γ -decalactone are believed, from odour evaluation of the gas chromatographic effluent, to make significant contribution to the plumlike character of this beverage. Of particular interest also is the presence of eugenol, rather than methyleugenol, reported in unfermented juice distillates. AA

ARTOCARPUS

- 1091 ROY (AN), SHARMA (RB) and SHARMA (KG). New market diseases of Barhal fruit.

Curr. Sci. 51(3); 1982; 143

It was found in Agra and Aligarh markets that 8-12% fruits of barhal (*Artocarpus lakoocha* Roxb) were infected by a fruit rot indicated by white, brown and black patches. The severely infected fruits showed irregular depressions and exuded a slimy substance emitting a repulsive fermented odour. Results of the investigation showed that this rot was caused by *Aspergillus niger* Van Tieghem and *Drechslera rostrata* (Drechsler) Richardson and Eraser. The injury inflicted during plucking, transportation, etc. was attributed for the host-pathogen relationship. *A. niger* produced soft, black rot which spread rapidly to spoil nearly half of the fruit within 8 days. It also resulted in irregular shallow depressions caused by disintegration of tissues accompanied with secretion of the yellowish substance with foul odour. *D. rostrata* caused irregular white brown spots, the rotten tissues turning water-soaked and emitting foul odour. MVG

APPLE

- 1092 GORMLEY (R). Dietary fibre-some properties of alcohol-insoluble solids residues from apples.

J. Sci. Food Agric. 32(4); 1981; 392-8

In the present study, alcohol insoluble solids (AIS) content of a number of apple cultivars, some of them grown under different methods of soil management, was investigated. Tests were conducted on the ability of the AIS to bind water and calcium *in vitro* and the pectin content of AIS material was also measured. The data indicate that AIS material from different apple cultivars varies in both amount and properties. The method of soil management had a lesser effect. KAR

PEAR

- 1093 RANDHAWA (JS), DHILLON (BS), BHULLAR (JS) and SANDHU (SS). Cold storage life of Le Conte pear fruit affected by post-harvest application of GA, CCC and Calcium chloride.

Indian Food Packer. 36(2); 1982; 41-43

Le Conte pear fruits were treated (dip method for 20 minutes) with (i) gibberellic acid (GA) (50 & 100 ppm), (ii) Cycocel (CCC) (500 & 1000 ppm and (iii) CaCl_2 (4, 6 and 8%), air dried, packed in wooden crates and stored at 0-3.3 °C with 85-90% RH. During this period of storage, the physiological weight loss (5.4%) was minimum in 8% CaCl_2 treated fruits followed by 4% CaCl_2 (7.0%), 50 ppm/GA (8.1%) and 6% CaCl_2 (8.4%) treatments. The maximum TSS and total sugars were found in 50 ppm GA and 6% CaCl_2 treatments respectively. The minimum acidity was recorded in CaCl_2 (4%) treated fruits. It is concluded that Le Conte pear fruits can be cold stored for 55 days after treating with 4 or 6% CaCl_2 or with 50 ppm GA. BSN

PAPAYA

- 1094 DABHADE (RS) and KHEDKAR (DM). Equilibrium Relative Humidity (ERH) of Tuti Fruiti Candy.

Indian Food Packer. 36(2); 1982; 16-8

Tuti fruiti, prepared from raw bits of lanced papaya, having 1% acid, 68 brix and 25.7% moisture was used for equilibrium relative humidity (ERH) studies. Optimum RH for storage of tuti fruiti was found to be 51.0%. Mould growth was observed about 70% RH within 8 days. BSN

GUAVA

- 1095 KHEDKAR (DM), ANSARWADKAR, (KW), DABHADE (RS) and BALLAL (AL). Extension of storage life of guava variety L-49.

Indian Food Packer. 36(2); 1982; 49-52

Guava variety L-49 was packed in polypack 100, 200 and 300 guages or treated with wax emulsion and stored at room temperature for 10 days. Based on data for pulp, Brix, acidity, vitamin C contents overall organoleptic score and percent marketable fruits, fruits packed in 300 gauge polypack showed low weight loss, more percentage of pulp and vitamin C and a high organoleptic score. BSN

SUGAR, STARCH AND CONFECTIONERY

- 1096 DANIEL (JR) and WHISTLER (RL). Sweetness-structure correlation in carbohydrates.

Cereal Chem. 59(2); 1982; 92-5

Some of the concepts of molecular connectivity and graph theory are used to show a relation between the structures of carbohydrates and their relative sweetness. A third order connectivity index, 3X_m , calculated for a sugar structure is in direct relation to sugar sweetness. Correlations between calculated 3X_m index value and relative sweetness are shown for simple sugars, glycosides, methyl ethers of sugar glycosides, pentoses, pentitols, hexoses, hexitols, sugar enantiomers, and several other classes of carbohydrate sweeteners. Most of the correlations show good correspondence. The index may be useful as a tool to aid in the design and selection of new, sweet synthetic carbohydrates. AA

- 097 VARRIANO-MARSTON (E), HOSENEY (RC) and DUNAWAY (JA). Alpha-amylase determination: Explanation for high falling numbers at lower bath temperatures.
Cereal Chem. 59(2); 1982; 151-2

- 098 GRAEFE (G). Living on "soft" energies - a utopia.
Starch. 32(9); 1980; 289 (German)

- 099 SPIES (RD) and HOSENEY (RC). Effect of sugars on starch gelatinization.
Cereal Chem. 59(2); 1982; 128-31

As the concentration of sugar in sugar-flour-water solutions was increased, the gelatinization temperature of the starch also increased. The gelatinization-delaying characteristics of a sugar solution were shown to be related to the water activity of the solution and to the molecular size of the sugar. As the water activity of a sugar solution decreased, gelatinization temperature of starch in the solution increased. But at equal water activities, not all sugars delayed gelatinization to the same extent. Sugars with longer chain lengths delayed gelatinization more than did shorter-chain sugars. Starch-sugar interactions may play a role in delaying starch gelatinization. Interaction of sugar with starch chains in the amorphous regions of the starch granule stabilizes those regions, thus increasing the energy required for gelatinization. AA

- 1100 NIIHARA (R) and MATSUMOTO (S). Trial method for measuring the effect of lipids on the rheological properties of starch paste during the gelation process.
J. Texture. Stud. 12(4); 1981; 559-71

- 1101 RAFFI (J), MICHEL (JP) and SAINT-LEBE (L). Theoretical study of the depolymerization of starch under the combined action of protons and gamma radiation.
Starch. 32(8); 1980; 262-5

- 1102 MICHEL (JP), RAFFI (J) and SAINT-LEBE (L). Experimental study of the radio depolymerization of starch.
Starch. 32(9); 1980; 295-8

The radio depolymerization of starch is studied by means of investigating the variations of intrinsic viscosity and of the rate of water-soluble products. The experimental results corroborate the theoretical laws proposed in an earlier paper. Special study of water-soluble products show how the theoretical laws can be used to investigate the chemical functions radio induced on the chains of dextrans. AA

- 1103 WING (R-E) and RAYFORD (WE). Polyethylenimine - starch products : Preparation and use in heavy metal removal.
Starch. 32(9); 1980; 299-302

Water-insoluble crosslinked starch was reacted with ethylenimine to yield polyethylenimine covalently bonded to the starch. Other products were prepared by reacting crosslinked starch containing 3-chloro-2-hydroxypropyl groups with polyethylenimine. The products were evaluated in removal of heavy metal cations and anions from industrial wastewater. AA

- 1104 KUGIMIYA (M), DONOVAN (JW) and WONG (RY). Phase transitions of amylose-lipid complexes in starches: A calorimetric study.
Starch. 32(8); 1980; 265-70

- 1105 ANTAL (M) and KUNIAK (L). Determination of the optimum reaction parameters for the base-catalysed preparation of HAMP starch.
Starch. 32(8); 1980; 276-8

- 1106 KEMPF (W) and MEYER (D). Present status of the law relating to feeding stuffs with particular reference to starch and starch products. Starch. 32(8); 1980; 278-83 (German)
- 1107 GHALI (Y), ATTIA (RM), ROUSHDI (M) and ALAAEL-DIN (M). Studies on the combined action of amylases and glucose isomerase on starch and its hydrolysates. II. Immobilization of glucoamylase. Starch. 32(9); 1980; 303-8
- Amberlite IR-45 resin was used for immobilization of glucoamylase and the factors affecting the binding power of enzyme to resin, pH, buffer concentration and methods used for immobilization were studied and discussed. Also the factors affecting the reaction velocity of immobilized enzyme were investigated. The immobilized enzyme has a higher km value (0.072) and narrow range of optimum temperature (65-70 C) than the free enzyme. Optimum pH for immobilized glucoamylase was 5.5 - 6.5, while it was 4.5 for free enzyme. AA
- 1108 KENNEDY (JF), FOX (JE) and SKIRROW (JC). Automated, computer calculated, qualitative and quantitative detailed analysis of starch components and related mono- and oligosaccharides. Starch. 32(9); 1980; 309-16

Liquid chromatographic techniques have been developed to provide a fully automated qualitative and quantitative analysis service for an extensive range of neutral mono- and oligosaccharides (DP 2-15) with on-line computer calculation of the data. The service is generally available for the analysis of monosaccharide, oligosaccharide, polysaccharides, glycoproteins, etc. in solids, solutions and biological fluids. The application of the analytical methods to industrially important starchy materials, i.e. to the analysis of starch hydrolysates for their oligosaccharides spectra, the expression of the (1→6)-linkage, amylopectin and amylose contents of starches, the analysis of glucose, fructose and psicose in fructose syrups derived from starches, and the identification of the less usual components of starchy and starchlike materials (panose, isopanose, maltotriose, isomaltose, isomaltotriose, etc.) are described. AA

GUM

- 1109 SAMARCO (EC) and PARENTE (ES). Automated high pressure liquid chromatographic system for determination of mannitol, sorbitol, xylitol in chewing gums and confections. J. Assoc. Off. Anal. Chem. 65(1); 1982; 76-8

CHOCOLATE

- 1110 NIEDIEK (EA) and BARBERNICS (L). Amorphisation of sugar by fine grinding of chocolate masses. Gordian. 80(11); 1980; 267-9 (German)

The strain on sugar in the five-roll chocolate refiner causes disintegration and partial amorphisation. For the production of a particularly good tasting chocolate the sugar must be as far as possible in the amorphous state in order to be aromatised. The amorphisation of the sugar at various roll adjustments is described and the dangers to the amorphous structure of the sugar by moisture and temperature is pointed out. AA

CROQUANT

- 1111 SCHREIBER (P). Croquant specialities. Gordian. 80(11); 1980; 270-2 (German)

Characteristics of four types of croquants have been described viz. puff croquant, mocca-puff-croquant, crumbly croquant, and soft croquant - all of which are used as fillings for pralines. KMD

BAKERY PRODUCTS

- 1112 VETTER (JL). Technology of sodium in bakery products. Cereal Food World. 26(2); 1981; 64-6
Sources of sodium, salt as related to flavour, salt and functionality and other alternative sources are dealt with. KAR
- 1113 KAUR (M) and BAINS (GS). Effect of L-cysteine HCl and oxidants on the extensograms and structural relaxation in dough. Nahrung. 24(9); 1980; 813-20
Dough extensibility increased considerably with 20 to 80 ppm L-cysteine HCl in the dough, whereas resistance to extension and curve area decreased perceptibly. The asymptotic loads of control doughs of medium protein (8.7 to 8.8%, 14% moisture basis) flours of WG 357 and WL 711 breadwheats were 253 BRABENDER Units (BU) and 238 BU. But with 20 ppm of L-cysteine HCl, the values decreased to 142 BU and 149 BU which further decreased steeply as the level of L-cysteine HCl was increased to 80 ppm. Ascorbic acid was more effective than bromate in counteracting the effect of 20 ppm of L-cysteine HCl in the dough. The values for structural relaxation constant decreased from 80 to 10 (WG 357) and from 70 to 10 (WL 711), as the level of L-cysteine HCl increased from 0.0 to 80 ppm. AA
- 1114 DAVIS (EW). Shelf-life studies on frozen doughs. Baker's Dig. 55(3); 1981; 12-6
Laboratory tests have shown that the inclusion of dough conditioners/crumb softeners in frozen dough can improve the quality of the product prepared from the dough. For dough which has undergone long term frozen storage, SSL was found to be more effective in maintaining product volume and softness. KAR
- 1115 THOMPSON (DR). Liquid sponge weighing systems for the bakery. Baker's Dig. 55(3); 1981; 24-6

BISCUITS

- 1116 HEIMANN (W), TIMM (U), RAPP (A) and KNIPSER (W). Changes of flavour compounds caused by addition of soyflour to short pastry. II. Investigations in biscuits. Z. Lebensmittel-Unters. Forsch. 171(1); 1980; 35-7 (German)
The volatile flavour compounds were isolated and most of them identified by combined gas chromatographic mass-spectral-analysis; they are responsible for the quantitative differences between the aroma-grams of usual and soy-fortified pastry. These flavour compounds were 1-hexanol, dimethylpyrazine, 2,3,5-trimethylpyrazine, furfural, benzaldehyde β -phenyl-ethanol, 2-methyl-3-hydroxy pyrone, 2-formylpyrrole and 4-vinylguajacol. The development of these flavour compounds during the baking process is discussed. AA
- 1117 BURT (DJ) and THACKER (D). Use of emulsifiers in short dough biscuits. Food Trade Rev. 51(7); 1981; 344,346-7,349-50
Emulsifiers were classified into 3 groups based on the hardness produced in biscuits. Those that produced softer biscuits and could be used as an economical replacement of fat are: diacetyltartaric acid esters of monoglycerides, sodium stearyl-2-lactylate and citric acid esters of monoglycerides. Citric acid esters of monoglycerides are added in the dough water, whereas the other two are added directly to the dough. KAR

CAKE

- 1118 CLEMENTS (RL) and DONELSON (JR). Role of free flour lipids in batter expansion in layer cakes. I. Effects of "Aging".
Cereal Chem. 59(2); 1982; 121-4
- 1119 CLEMENTS (RL) and DONELSON (JR). Role of free flour lipids in batter expansion in layer cakes. II. Effects of heating.
Cereal Chem. 59(2); 1982; 125-8
- 1120 GAINES (CS). Technique for objectively measuring relationship between flour chlorination and cake crumb stickiness.
Cereal Chem. 59(2); 1982; 149-50
Objective evaluation showed that stickiness of cake crumb was negatively correlated with flour chlorination rate. However, flour pH and cake volume did not show high correlation with objective cake crumb stickiness. BSN

NOODLE

- 1121 LABUZA (TP), BOHNSACK (K) and KIM (MN). Kinetics of protein quality change in egg noodles stored under constant and fluctuating temperatures.
Cereal Chem. 59(2); 1982; 142-8
Browning rate and loss of protein in egg noodles stored for 48 weeks increased with increased temperature and a_w with the Q_{10} for browning and lysine loss ranging between 2 and 4. About 25% lysine was lost at the end of 40-45 weeks at 25 C, whereas at 45 C, the same degree of loss was observed after 6-12 weeks of storage. BSN

MILK AND DAIRY PRODUCTS

- 1122 DeBOER (AJ). Socio-economic aspects of dairying in developing countries.
J. Dairy Sci. 64(12); 1981; 2453-62
- 1123 McDOWELL (RE). Limitations for dairy production in developing countries.
J. Dairy Sci. 64(12); 1981; 2463-75
- 1124 SPECK (ML). Use of microbial cultures: Dairy products.
Food Technol. 35(1); 1981; 71-3
Discusses the different aspects of the use of microbial cultures in dairy products and their influence on lactase intolerance, nitrosamine production, relation to cholesterol and incidence of cancer. KAR
- 1125 den HARTOG (AP). Changing dietary patterns in developing countries and the role of dairy products.
Voeding. 41(8); 1980; 292-302
A survey of dietary patterns in areas where milk is, or is not, a traditional food. KMD
- 1126 STOLOFF (L), WOOD (G) and CARTER (L) Jr. Aflatoxin M_1 in manufactured dairy products in the United States in 1979.
J. Dairy Sci. 64(12); 1981; 2426-30

MILK

- 1127 HOLT (C). Inorganic constituents of milk. III. The colloidal calcium phosphate of cow's milk.
J. Dairy Res. 49(1); 1982; 29-38
Experiments involving the depletion of milk calcium phosphate (MCP) with EDTA have shown that it has a Ca to phosphate ratio of 1.61 ± 0.04 , close to that of dental enamel. The calcium phosphate also contains small amounts of citrate ($\text{citrate}/\text{P}_i = 0.097 \pm 0.011$) and Mg ($\text{Mg}/\text{P}_i = 0.044 \pm 0.011$). These experiments and model calculations indicate that the Ca binding capacity of casein is not reduced by mineralization with calcium phosphate and hence that ion binding sites and nucleation sites are distinct, or nearly so. Calculations of the ionic equilibria in the aqueous phase of milk show that there is an invariant ion activity product for a molecular formula close to that of dicalcium phosphate. It is suggested that MCP is a mixture of salt, with dicalcium phosphate a precursor of more basic salts such as octacalcium phosphate and hydroxyapatite. AA
- 1128 CURTIS (AR) and HAMMING (P). Differential pulse polarographic determination of total iodine in milk.
J. Assoc. Off. Anal. Chem. 65(1); 1982; 20-33
- 1129 ASHES (JR), BURLEY (RW), DAVENPORT (JB) and SIDHU (GS). Effects of dietary supplements of protected lipids on the concentration and transport of β -carotene and cholesterol in bovine blood and milk: Unusual chromatographic behaviour of the high-density lipoprotein with high levels of β -carotene.
J. Dairy Res. 49(1); 1982; 39-49
- 1130 ANDERSON (M). Factors affecting the distribution of lipoprotein lipase activity between serum and casein micelles in bovine milk.
J. Dairy Res. 49(1); 1982; 51-9
- 1131 PHIPPS (LW) and TEMPLE (DM). Surface properties of milk fat globules: Interfacial tension studies.
J. Dairy Res. 49(1); 1982; 61-72
- 1132 PARODI (PW). Positional distribution of fatty acids in the triglyceride classes of milk fat.
J. Dairy Res. 49(1); 1982; 73-80
A sample of milk fat was fractionated into high, medium and low molecular weight triglycerides by silicic acid column chromatography. Each fraction was further separated by silver ion adsorption thin-layer chromatography into triglyceride classes which were subjected to stereospecific analysis. *Trans*-monoene fatty acids were incorporated into triglycerides in the same manner as their *cis*-isomer. The specific positional distribution for fatty acids in intact milk fat triglycerides was not always maintained in the molecular weight fractions or in the various classes of unsaturation. The significance of these findings is discussed in relation to biosynthetic mechanisms for milk fat synthesis. AA
- 1133 ARUMUGHAN (C) and NARAYANAN (KM). Triacylglycerol composition of buffalo milk fat.
J. Dairy Res. 49(1); 1982; 81-5
Buffalo milk fat was first separated by thin layer chromatography (TLC) into high (HMT), medium (MMT) and low (LMT) molecular weight triacylglycerols. The triacylglycerol (TG) fractions thus obtained were further resolved by argentation TLC into saturated, *trans*-monoene, *cis*-monoene, diene and polyene TG species. Whereas 18:1 was concentrated in HMT, 6:0, 8:0 and 10:0 tended to be located in MMT. LMT was unique in containing almost all 4:0, HMT, MMT and LMT showed

great variations in their levels of different TG species. The distribution of fatty acids among the TG species was found to be characteristic of each TG species. AA

- 1134 MARSHALL (RJ), HATFIELD (DS) and GREEN (ML). Assessment of two instruments for continuous measurement of curd-firming of renneted milk. J. Dairy Res. 49(1); 1982; 127-35

Continuous measurements of curd-firming using a commercial vibrating-reed viscometer and a pressure transmission system (PTS) developed at this Institute were compared both in the laboratory and during Cheddar cheesemaking. The coefficient of variation about the mean of the curd-firmness measured in reconstituted skim-milk 40 minutes after renneting was 3.5% with the viscometer and 2.6% with the PTS. The effects of changes in conditions on the curd-firming rate of raw whole milk were determined. As the rennet concentration was raised the rates increased linearly as measured by the viscometer, but non-linearly as measured by the PTS. Addition of CaCl_2 increased the rates measured by both instruments rapidly at first then more slowly at higher levels. Raising the temperature increased the rate exponentially in the case of the viscometer but more slowly with the PTS. With both instruments the curd-firming rates of milk at pH 5.8 were 6.5 times those at pH 6.7 but the rates fell slightly at pH 5.6. In experimental cheesemaking, the mean readings of both instruments at the subjectively determined cutting time of the curd had the same coefficient of variation. The commercial viscometer is probably more suitable for laboratory investigations of the earlier stages of the coagulation of milk by rennet whilst the PTS may prove the more useful in indicating the optimum cutting time of the curd during cheesemaking. AA

- 1135 SHALABI (SI) and FOX (PF). Influence of pH on the rennet coagulation of milk. J. Dairy Res. 49(1); 1982; 153-7

- 1136 GREEN (ML). Effect on the composition and properties of casein micelles of interaction with ionic materials. J. Dairy Res. 49(1); 1982; 87-98

- 1137 GREEN (ML). Mode of binding of ionic materials to casein micelles. J. Dairy Res. 49(1); 1982; 99-105

- 1138 HORNE (DS). Calcium-induced precipitation of α_{S1} -casein: Effect of inclusion of citrate or phosphate. J. Dairy Res. 49(1); 1982; 107-18

- 1139 BEDDOWS (CG) and KIRK (D). Determination of fluoride ion in bovine milk using a fluoride ion-selective electrode. Analyst. 106(1269); 1981; 1341-4

- 1140 FAULKNER (A) and PEAKER (M). Reviews of the progress of dairy science: Secretion of citrate into milk. J. Dairy Res. 49(1); 1982; 159-69

Discusses: forms and sources; secretory pathway; intraspecific variation in milk citrate; interspecific variations; biochemistry in mammary secretory cells; and recent developments. BSN

- 1141 MILLER (M), KIERMEIER (F), WEISS (G) and KLOSTERMEYER (H). Aflatoxin M_1 in milk and milk products. A comparison of some determination procedures. Z. Lebensmittel-Unters. Forsch. 171(1); 1980; 20-3

SKIM-MILK POWDER

- 1142 KELLY (PM). Effect of seasonal variation, urea addition and ultra-filtration on the heat stability of skim-milk powder. J. Dairy Res. 49(1); 1982; 119-26

The heat stability of skim-milk powder varied throughout the season, but was highest during the period April-August. Addition of urea increased heat coagulation times during March-August, but the extent of increase was dependent upon urea addition either before or after preheating for 30 minutes at 90 C during manufacture. During March-June, higher heat stabilities were recorded when urea was added after preheating, while in July-August urea added before preheating was more effective. Partial ultrafiltration before dehydration decreased the heat stability of reconstituted milks due to a loss of natural urea in the permeate together with a disruption in the salt balance. AA

KHOA

- 1143 LEMBHE (AF), RANGANATHAN (B), RAMANA RAO (MV) and KRISHNA RAO (L). Aflatoxin production in khoa. J. Food Prot. 44(2); 1981; 137-8

Aspergillus parasiticus NRRL 2999 and *Aspergillus flavus* K₃ were examined for aflatoxin production in khoa. The inoculated khoa samples were examined after incubation for 2 weeks at 5, 28 and 37 C. Aflatoxin penetrated to a depth of 4 cm in the inoculated khoa samples stored at 28 and 37 C. AA

YOGURT

- 1144 AYEBO (AD), SHAHANI KM) and DAM (R). Antitumor component(s) of yogurt: Fractionation. J. Dairy Sci. 64(12); 1981; 2318-23
- 1145 MARSHALL (VME), COLE (WM) and MABBITT (LA). Yogurt made from single starter organisms using heat-or enzyme-treated milk or milk to which casein hydrolysate or sodium formate is added. J. Dairy Res. 49(1); 1982; 147-52

BUTTER

- 1146 KAWANARI (M), HAMANN (DD), SWARTZEL (KR) and HANSEN (AP). Rheological and texture studies of butter. J. Texture Stud. 12(4); 1981; 483-505

CHEESE

- 1147 DIMITROFF (D), OBRETENOVA (M) and OBRETENOV (TZV). Use of microbial enzyme preparations in cheese production. Part VII. Changes of the volatile fatty acids in kaschkawal cheeses made from ewe's and cow's milk using the bacterial preparation "Mesenterin 11-11". Nahrung. 24(9); 1980; 869-74 (German)
- Kaschkawal cheeses have been made under production conditions from ewe's and cow's milk; the bacterial enzyme preparation "Mesenterin 11-11", the Bulgarian cheese rennet "Pharmachin" and the Danish chymosin rennet were used. The behaviour of the volatile fatty acids during the ripening process was followed over a period of 90 days. New findings concerning the significance of the index $K = \frac{C_2 - C_4}{C_5 C_8}$ as a criterion for cheese quality are discussed. AA

- 1148 KRISHNA NAND, SRIKANTA (S), NAGARAJA RAO (KS) and SREENIVASA MURTHY (V). Comparison of the yield and quality of cheese made with calf-rennet and treated enzyme preparations of *Rhizopus oligosporus* as coagulants. *Nahrung*. 24(9); 1980; 859-68

The curd working properties and chemical compositions of Cheddar cheese prepared with different enzyme preparations of *Rhizopus oligosporus* No.1104 were compared with calf-rennet cheese. Three coagulants derived from *R. oligosporus* exoenzyme: heat treated (HT), aluminium trioxide adsorbed (ATA) and heated and aluminium trioxide adsorbed (HATA), having considerably less proteolytic activity were used along with crude enzyme (RO) for cheese making. These enzyme preparations did not affect significantly the renneting time, the acidity development, fat loss in whey and the yields of green cheese as compared to calf-rennet, but they did show higher proteolysis and lipolysis. Cheese made with these enzymes graded slightly inferior in the organoleptic qualities to calf rennet cheese. However, in the early stages of ripening these cheese exhibited body and flavour closer to calf-rennet cheese. AA

- 1149 LAW (BA) and WIGMORE (A). Accelerated cheese ripening with food grade proteinases. *J. Dairy Res.* 49(1); 1982; 137-46

The development of typical flavour in Cheddar cheese was accelerated by the addition of bacterial neutral proteinase to the curds, but not by the addition of fungal acid proteinase which produced a bitter defect even at low concentrations. An optimum level of neutral proteinase addition was established at which general proteolysis was increased by about 20% in 2 months and treated cheeses of this age had flavour intensities typical of 4-month-old untreated cheeses. Enzyme-treated cheeses were softer-bodied and more brittle than untreated cheeses of the same age. AA

- 1150 LEE (YH) and MARSHALL (RT). Microstructure and texture of process cheese, milk curds, and caseinate curds containing native or boiled soy proteins. *J. Dairy Sci.* 64(12); 1981; 2311-7

ICE CREAM

- 1151 THOMAS (EL). Structure and properties of ice cream emulsions. *Food Technol.* 35(1); 1981; 41,44,46,48

Aspects covered include composition and structure of ice cream, emulsions based on natural milk fat; and the fat emulsion in ice cream mix; changes occurring in fat emulsion during freezing and further work needed in evaluation and research aspects. KAR

MEAT AND POULTRY

- 1152 SIELAFF (H) and HOFT (KH). Electric conductivity of meat as objective material index for process control. Parts I and II. *Fleisch*. 33; 1979; (9) 164-167; (10) 196-198

The studies concern the relation between the changes in raw material meat as a result of effect of heat and the electric conductivity. The electric conductivity was measured with a special electrode in the low frequency range. further, a modified fish tester was used to determine the ratio of two resistances measured at various frequencies. It was found that the suitable temperatures for the measuring processes for determining the change in conductance during the thermal treatment are between 20 C and 60 C. Determinations of additives (fat, table salt and water) to a given composition a raw material can be made by measuring the electric conductivity. KMD

- 1153 SCHNABEL (G) and HERRMANN (K). Measures for the improvement of the metrology in the meat industry. *Fleisch*. 33(10); 1979; 187-8 (German)
- 1154 PARTMANN (W) and SCHLASZUS (H). Investigations on the origin of two radiation-induced compounds in irradiated meat. *Z. Lebensmittel-Unters. Forsch.* 171(1); 1980; 1-4
- 1155 GRIFFITHS (NM), BILLINGTON (MJ) and GRIFFITHS (W). A review of three modern techniques available for the determination of soya protein in meat products. *J. Assoc. Public Anal.* 19(Pt.4); 1981; 113-9
 Three techniques for the determination of soya protein in meat products are reviewed, respectively based on microscopy, HPLC and enzyme linked immunosorbant assay (ELISA). The cost, speed and accuracy are compared by applying these techniques to standard mixes of hydrated soya material, meat and hydrated rusk which resembled sausage meat in composition. AA
- 1156 BACUS (JN) and BROWN (WL). Use of microbial cultures: Meat products. *Food Technol.* 35(1); 1981; 74-8,83
 Starter cultures developed for meat safety aspects including the poisoning caused by *St. aureus*, *Salmonella*, *Cl. botulinum*, and *Trichinae spiralis*, histamines and nitrosamines associated with food poisoning outbreak and extension of shelf life of meat and meat products by microbial cultures have been covered. KAR
- 1157 MERKAL (RS), LYLE (PS) and WHIPPLE (DL). Heat inactivation of *in vivo*- and *in vitro*-grown mycobacteria in meat products. *Appl. Environ. Microbiol.* 41(6); 1981; 1484-5

BEEF

- 1158 NORMAN (GA) and DeFELICIO (PE). Effects of breed and nutrition on the productive traits of Zebu, Charolais and crossbreed beef cattle in South-East Brazil. Part 1: Body and gross carcass composition. *Meat Sci.* 5(6); 1981; 425-38
- 1159 SWATLAND (HJ). Cellular heterogeneity in the response of beef to electrical stimulation. *Meat Sci.* 5(6); 1981; 451-5
- 1160 MASCHERONI (RH), ANON (MC) and CALVELO (A). Basis for a method of characterisation for quick frozen beef. *Meat Sci.* 5(6); 1981; 457-72
 For better commercial development, simple methods of quality control are needed to distinguish between quick frozen and normally frozen products. Usually, the specifications for quick frozen meat have been limited to a description of the freezing process rather than to the establishment of quality standards which could be detected by tests on the product itself. In a previous paper, a maximum in the weight of drip obtained on thawing was identified at local freezing times (-1 C to -7 C) of 17 minutes. The higher the freezing rate, the deeper the position of this maximum. Simultaneously, a computer model was developed to define the local freezing time and link it with an average freezing rate through the stimulation of heat transfer, during meat processing in plate freezers. Based on these findings, a characterisation of quick frozen meat has been quantitatively developed in terms of the maximum position. AA

- 1161 MARSH (BB), LOCHNER (JV), TAKAHASHI (G) and KRAGNESS (DD). Effects of early post-mortem pH and temperature on beef tenderness. *Meat Sci.* 5(6); 1981; 479-83
- 1162 DAHL (CA), MATTHEWS (ME) and MARTH (EH). Survival of *Streptococcus faecium* in beef loaf and potatoes after microwave-heating in a simulated cook/chill food service system. *J. Food Prot.* 44(2); 1981; 128-33,136
Increasing the time of microwave-heating for portions of beef loaf or potatoes decreased the count on KF agar, regardless of internal or external inoculation procedure. Eighty or 85 sec of microwave-heating of beef loaf or potatoes resulted in portions with similar numbers of bacteria as determined by KF agar, but mean internal end temperatures ranged from 66 to 95 C. AA
- 1163 EL-ZEANY (BA), ABDEL FATTAH (LE) and HASSAN (IM). Stability of fat during irradiation and subsequent storage of irradiated buffalo meat. *Z. Lebensmittel-Unters. Forsch.* 171(1); 1980; 5-8
Buffalo meat steaks were irradiated with gamma rays in doses of 0.550 and 1100 krad and stored at 2 ± 1 C. The changes in lipids extracted from the steaks were investigated. Peroxides and carbonyl compounds accumulated during irradiation and subsequent storage of the irradiated meat. Oxidation products were higher if irradiation was carried out with 1100 krad than with 550 krad. Soaking of the steaks in butylated hydroxy toluene (BHT) and sodium pyrophosphates before irradiation markedly reduced the amount of peroxides and carbonyl compounds formed during irradiation and storage. An electric treatment of meat muscle (800 V for 45 seconds) reduced weeping, but increased slightly the rate of autoxidation of lipids. The browning reaction was slow during cold storage of irradiated meat, but increased upon storage of extracted lipids at room temperature. AA

SHEEP

- 1164 KIRTON (AH), FRAZERHURST (LF), BISHOP (WH) and WINN (GW). A comparison of the effects of electrical captive bolt or percussion stunning on the incidence of blood splash in lambs. *Meat Sci.* 5(6); 1981; 407-11

PORK

- 1165 MONIN (G), SELIER (P), OLLIVIER (L), GOUTEFONGEA (R) and GIRARD (JP). Carcass characteristics and meat quality of halothane negative and halothane positive pietrain pigs. *Meat Sci.* 5(6); 1981; 413-23
- 1166 RAHELIC (S) and PUAC (S). Fibre types of *Longissimus dorsi* from wild and highly selected pig breeds. *Meat Sci.* 5(6); 1981; 439-50
- 1167 SEN (NP) and SEAMAN (SS). A rapid liquid-liquid extraction cleanup method for the determination of volatile N-nitrosamines in cooked-out bacon fat. *J. Agric. Food Chem.* 30(2); 1982; 364-7
A rapid liquid-liquid extraction method is described for the determination of volatile nitrosamines in cooked-out bacon fat. The method consists of partitioning of the nitrosamines between n-hexane and an acidic aqueous-methanol mixture containing small amounts of sulphamic acid. An aliquot of the aqueous phase is then extracted with dichloromethane, the dichloromethane extract concentrated, and an aliquot of the concentrated extract analyzed by a GLC-thermal energy analyzer. The average percentage recoveries of N-nitrosodimethylamine, N-nitrosodiethylamine, N-nitrosopiperidine, N-nitrosopyrrolidine, and

N-nitrosomorpholine when added to cooked-out bacon fat or lard at levels ranging between 5 and 20 ppb were 78.8, 77.8, 89.4, 100.3 and 97.4, respectively. The method has an overall detection limit of 1 ppb for each of the above five nitrosamines. The average levels (uncorrected) of N-nitrosodimethylamine and N-nitrosopyrrolidine detected in the 11 samples of cooked-out bacon fat were found to be 4.8 and 21.1 ppb, respectively. AA

- 1168 PENSABENE (JW), MILLER (AJ), GREENFIELD (EL) and FIDDLER (W). Rapid dry column method for determination of N-nitrosopyrrolidine in fried bacon.

J. Assoc. Off. Anal. Chem. 65(1); 1982; 151-6

This simple screening method of estimating N-nitrosopyrrolidine in fried bacon, by a column chromatographic procedure, enables one person to analyze 25 samples per day. Recovery at the 10 ppb level was over 90%. The results are in good agreement with those obtained by the mineral oil distillation procedure currently used by the Food Safety and Inspection Service (FSIS), USA. KMD

- 1169 FARNWORTH (ER) and TRENHOLM (HL). The effect of acute administration of the mycotoxin zearalenone to female pigs.

J. Environ. Sci. Health. B16(3); 1981; 239-52

SWINE

- 1170 MILLER (DM), WILSON (DM), WYATT (RD), McKINNEY (JK), CROWELL (WA) and STUART (BP). High performance liquid chromatographic determination and clearance time of aflatoxin residues in swine tissues.

J. Assoc. Off. Anal. Chem. 65(1); 1982; 1-4

Twelve hours after dosing, aflatoxin residues were present in liver and kidney, but not in muscle; but residues could be detected in muscle also after 24 hours. Residue levels then decreased for the next 48 hours in all tissues. No aflatoxin residues were detected in muscle from any pig, 72 hours after dosing, or in pigs fed the 400 ng/g diet: but they were present in the muscle of pigs fed the 800 ng/g diet. KMD

HORSE

- 1171 BABIKER (SA), GLOVER (PA) and LAWRIE (RA). Improved methodology for the electrophoretic determination of horse meat in heated foodstuffs. Meat Sci. 5(6); 1981; 473-7

Using linear gradient polyacrylamide gel electrophoresis to separate constituent proteins, horse meat could be clearly distinguished from beef even after heating for 20 minutes up to 120 C. AA

CHICKEN

- 1172 WEIGERT (P). Heavy metal content of chicken eggs. Z. Lebensmittel-Unters. Forsch. 171(1); 1980; 18-9

Chicken eggs were analysed by means of AAS (atomic absorption spectrometry) - for Pb, Cd, Hg, As and Se, after separation into shell, albumen and yolk. The average contents of the edible parts were 0.075 ppm Pb, 0.025 ppm Cd, 0.005 ppm Hg, 0.280 ppm As and 0.450 ppm Se in dry matter. AA

TURKEY

- 1173 McKINLEY (GA) and AVENS (JS). Microbial quality of ground and comminuted, raw and cooked turkey meat. J. Food Prot. 44(2); 1981; 139-43

- 1174 SWAMINATHAN (B), HOWE (JM) and ESSLING (CM). Mayonnaise, sandwiches and *Salmonella*.
J. Food Prot. 44(2); 1981; 115-7,127

Mayonnaise had a significant inhibitory effect on growth of *S. typhimurium* in sandwiches prepared with turkey breast meat; however, mayonnaise did not prevent *Salmonella* from multiplying when the sandwiches were stored at 21 to 30 C for 8 or 24 hour. AA

QUAIL

- 1175 SINGH (RP), PANDA (B) and KULSHRESTHA (SB). Preparation and keeping quality of pickled quail meat.
J. Food Sci. Technol. (India) 19(4); 1982; 159-60

Dressed quail (*Coturnix coturnix japonica*) carcasses were cooked and pickled in 4 different pickle solutions containing 50 and 75% synthetic vinegar and 8 and 10% common salt besides 2% each of garlic, ginger and spice mixture. They were stored in glass jars at room (26 C) and refrigeration (5±1 C) temperatures for 2 months. Changes in pH, microbiological and sensory parameters were studied during the storage period. It was concluded that pickling in 50% vinegar with 8 or 10% salt and 2% each of the spice mixture, garlic and ginger gave pickle of good quality which could be stored for 2 months. KAR

PIGEON

- 1176 EL-SAYED (WA), SHEHAB (AH), MOURAD (FE), EL-WAHRY (FI) and SAID (AK). Biochemical and biological evaluation of pigeon meats: Effect of type, age and sex.
Nahrung. 24(9); 1980; 821-28

Pigeon meats contain large amount of fats. They have a high energy value and contain all essential amino acids in amounts and proportions required by the human body. They are excellent sources of vitamins and minerals, particularly B₁, B₂, calcium, phosphorus and iron. No significant differences were encountered due to variations of variety or sex. AA

SEAFOODS

- 1177 HAMILTON (WD). Fish species identification by thin layer agarose isoelectric focusing and densitometric scanning.
J. Assoc. Off. Anal. Chem. 65(1); 1982; 119-22

Examination of sarcoplasmic proteins of fish by thin layer polyacrylamide gel isoelectric focusing as a means of fish species identification is a powerful and reliable technique, but it displays a number of disadvantages. These problems include the care required when handling acrylamide monomer (a neurotoxin), the mechanical skill needed in molding the gel, the difficulties in ensuring correct gel polymerization, and the extensive destaining periods. Specially treated agarose has been used to obtain protein patterns for an interval of pH 5-8. The patterns so produced were scanned by a densitometer in the visible range after completing staining and destaining. Most of the problems associated with polyacrylamide gels have been overcome by using agarose as a support medium. AA

- 1178 JOHNSON (EA), PELEG (M), SEGARS (RA) and KAPSALIS (JG). A generalized phenomenological rheological model for fish flesh.
J. Texture Stud. 12(4); 1981; 413-25

The mechanical properties of raw and cooked fish were qualitatively characterized by a generalized Maxwell model in which each of the Maxwell elements is modified by incorporation of a contact and two fracture elements. The activation and inactivation of elements have been used

as a means of expressing transformation of the rheological characteristics, not only as a function of the strain and strain rate history but also as a function of temperature and time. Although no attempt has been made to quantify the number of elements and their characteristic constants, it is shown that the different modes of rheological behaviour exhibited by fish flesh can consistently be described by this kind of model. AA

- 1179 SUHADI (F), THAYIB (SS) and SUMARSONO (N). Distribution of *Clostridium botulinum* around fishing areas of the Western Part of Indonesian waters. Appl. Environ. Microbiol. 41(6); 1981; 1468-71

SQUID

- 1180 SLABYJ (BM) and TRUE (RH). Preprocess holding of squid (*Illex illecebrosus*) and quality of canned mantles. J. Food Prot. 44(2); 1981; 109-11,114

Shelf life of brine refrigerated whole squid (*Illex illecebrosus*) was about 3 days at 7.2 C and 5 days at 0.6 C. No difference in keeping quality was detected when using 3 or 12% brine. Salt-requiring, heat-sensitive bacteria predominated in the spoilage flora. Sensory evaluation of whole squid and canned mantles showed significant correlations with trimethylamine-nitrogen and tyrosine content of the raw material. Precanning blanching caused 37% shrinkage and 15% loss of dry matter in fresh squid, which increased with preprocess storage conditions to a maximum of 56% shrinkage and 42% loss of dry material. AA

OYSTER

- 1181 TWEDT (RM), MADDEN (JM), HUNT (JM), FRANCIS (DW), PEELER (JT), DURAN (AP), HERBERT (WO), McCAY (SG), RODERICK (CN), SPITE (GT) and WAZENSKI (TJ). Characterisation of *Vibrio cholerae* isolated from oysters. Appl. Environ. Microbiol. 41(6); 1981; 1475-8
- 1182 ROWSE (A). Evaluation of media used in rapid methods for the MPN enumeration of fecal coliforms in the Sydney Rock Oyster (*Crassostrea commercialis*). J. Food Prot. 44(2); 1981; 134-6

ALLIGATOR

- 1183 OBLINGER (JL), KENNEDY (JE) Jr., McDONALD (ED) and WEST (RL). Microbiological analysis of alligator (*Alligator mississippiensis*) meat. J. Food Prot. 44(2); 1981; 98-9,108

The two tail muscles, ilio caudalis and ischio caudalis, along with hide surface areas from four alligators, *Alligator mississippiensis*, were evaluated for microbial numbers and types. Microbial analyses of hide surfaces yielded a mean aerobic plate count (APC, 35 C) of approximately 4.45 logs/cm² at 35 C and total coliform counts were low. *Salmonella* was not recovered from hide or tissue samples. APCs of fresh meat samples were low (2.88-3.02 logs/g) regardless of muscle type, with no recovery of fecal coliforms or *Escherichia coli*. Microbial development in meat stored at 1.7 C for up to 15 days was comparable to that reported for fresh beef. Typical microorganisms recovered included *Corynebacterium*, *Staphylococcus*, *Micrococcus*, *Flavobacterium*, *Pseudomonas*, *Acinetobacter*, *Arthrobacter*, and yeasts. AA

PROTEIN FOODS

Nil

FRUIT JUICES AND BEVERAGES

- 1184 KACPRZAK (JL). Atomic absorption spectroscopic determination of dimethylpolysiloxane in juices and beer.
J. Assoc. Off. Anal. Chem. 65(1); 1982; 148-50
Dimethylpolysiloxane (DMPS) is an antifoaming agent used in fruit juices and beer. A method of estimating DMPS in beverages has been described; the limit of detection is 0.2 ppm. KMD
- 1185 INDIRA MURTI (AS), MALATHI (HN), RAJALAKSHMI (D) and POTTY (VH). Industrial wastes and byproducts in distilleries and breweries.
Indian Food Packer. 36(2); 1982; 67-79
This is a report of a survey conducted by CFTRI in 1972-73. After briefly reviewing the development of alcohol industry in India, the authors describe the mode of utilisation/disposal of distillery wastes and the chemical composition of distillery spent wash and yeast sludge. Byproducts of brewing industry, including their mode of utilisation have also been covered. BSN
- 1186 MARK (FG) and VAUGHN (TE). Determination of proof by distillation: Low results for cocktails and specialty products.
J. Assoc. Off. Anal. Chem. 65(1); 1982; 108-9
A variety of specialty products, as well as alcohol solutions containing individual ingredients of the products, were proofed according to the accepted distillation method for beverages containing ≥ 600 mg extract/100 ml. Products and solutions containing non-dairy creamer, combinations of citric acid and sugar, or acetic acid gave distillates with specific gravities corresponding to proofs 0.2-0.70 lower than expected. Low results caused by carryover of acetic acid into the distillate can be prevented by making the sample alkaline before distillation. The mechanism of apparent reduced recovery of alcohol in the other cases is still under investigation. AA

COFFEE

- 1187 DURLAND (SS). A pedal-powered coffee pulper for village use.
Appropriate Technol. 8(1); 1981; 28
Description and working of the machine developed in Papua New Guinea. KAR

COCOA BUTTER

- 1188 HO (C-T), JIN (QZ), LEE (KN) and CARLIN (JT). 2-acetyl-5-chloropyrrole in the volatile flavour constituents of cocoa butter.
J. Agric. Food Chem. 30(2); 1982; 362-4
The synthesis of the 2-acetyl-5-chloropyrrole, the first chlorinated heterocyclic compound present as a volatile flavour component of cocoa butter (confirmed as the volatile flavour constituent through synthesis of authentic compound), became possible by chlorination of 2-acetylpyrrole. By means of IR, NMR and MS, the structure of the synthesised compound was established. As a volatile flavour component of cocoa butter, the compound was confirmed by comparison of MS and GS retention times with that of authentic sample. BSN

WINE

- 1189 HEDBERG (PR) and RAISON (J). The effect of vine spacing and trellising on yield and fruit quality of Shiraz grapevines. *Am. J. Enol. Vitic.* 33(1); 1982; 20-30
- 1190 SPETTOLI (P), BOTTACIN (A), NUTI (MP) and ZAMORANI (A). Immobilization of *Leuconastoc oenos* ML 34 in calcium alginate gels and its application to wine technology. *Am. J. Enol. Vitic.* 33(1); 1982; 1-5
- 1191 FEUILLAT (M) and CHARPENTIER (C). Autolysis of yeasts in champagne. *Am. J. Enol. Vitic.* 33(1); 1982; 6-13
- 1192 BROWN (MR) and OUGH (CS). Effects of two different pectic enzyme preparations, at several activity levels, on three pectin fractions of a white must. *Am. J. Enol. Vitic.* 33(1); 1982; 41-3
 A procedure for fractional extraction and quantitative determination of pectic substances in grapes was used to determine the changes in the proportions of the three pectic fractions: protopectin, high methoxy pectin and low methoxy pectin, due to the treatment of the musts with two different pectic enzyme preparations. It was found that the protopectin and low methoxy fractions decrease with either enzyme treatment. The high methoxy fraction, however, increased dramatically at the lower enzyme concentration i.e. 1000 PGU/ton, but decreased at higher concentrations. AA
- 1193 JOLLY (DRP). Wine flavour extraction with liquid carbon dioxide. *Process. Biochem.* 16(5); 1981; 36-40

SHERRY

- 1194 FAGAN (GL), KEPNER (RE) and WEBB (AD). Additional volatile components of palomino film sherry. *Am. J. Enol. Vitic.* 33(1); 1982; 47-50

OILS AND FATS

- 1195 POKORNY (J), KMINEK (M), KVASNICKOVA (A), SCHMIDT (O) and DAVIDEK (J). Lipid oxidation. Part V. Effect of copper on the autoxidation of methyl oleate. *Nahrung.* 24(9); 1980; 851-8
- 1196 VAN HEDDEGHEM (A), HUYGHEBAERT (A) and DE MOOR (H). Determination of polycyclic aromatic hydrocarbons in fat products by high pressure liquid chromatography. *Z. Lebensmittel-Unters. Forsch.* 171(1); 1980; 9-13
- 1197 JAYASHREE POHIT, NAMITA PAL and PAL (B). Zinc content of fats and oils. *Indian J. Nutr. Dietet.* 18(9); 1981; 341-2
 Zn content of nine edible oils ranged from 0.40 for shortening (vanaspati) to 1.87 $\mu\text{g/g}$ in mustard oil. The values for other oils were found to be intermediate and in buffalo ghee, cow ghee, coconut oil, groundnut oil, rapeseed oil and sunflower oil, they were 0.54, 0.71, 1.25, 0.75, 0.91, 0.95 and 1.57 $\mu\text{g/g}$ respectively. BSN
- 1198 HERSLOF (B), HERSLOF (M) and PODLAHA (O). Simple small scale preparations of specific triglycerides and triglyceride mixtures. *Fette Seifen Anstrichm.* 82(11); 1980; 460-2

Interesterification reactions between two fatty acid methyl esters and trilaurin are investigated. The reaction products are analyzed by HPLC and GC. Great correspondence is found between the calculated and experimental compositions. One of the components is collected from a semipreparative HPLC column. It shows a very high purity and can be used as a reference substance. AA

- 1199 EL-HAMDY (AH) and PERKINS (EG). High performance reversed phase chromatography of natural triglyceride mixtures: Critical pair separation. J. Am. Oil Chem. Soc. 58(9); 1981; 867-72

- 1200 DAVIDEK (J), VELISEK (J), KUBELKA (V), JANICEK (G) and SIMICOVA (Z). Glycerol chlorohydrins and their esters as products of the hydrolysis of tripalmitin, tristearin and triolein with hydrochloric acid. Z. Lebensmittel-Unters. Forsch. 171(1); 1980; 14-7

Tripalmitin, tristearin and triolein were chosen as representatives of neutral lipids - triglycerides. These compounds were hydrolyzed by hydrochloric acid under the conditions used in the production of protein hydrolysates. Reaction products were isolated after separation on silica gel column and their infrared, NMR and mass spectra were compared with those of authentic synthesized compounds. Besides the already known hydrolytic products of triglycerides (above all 1,3 dichloropropan-2-ol and 3-chloropropane-1,2-diol), some esters of these alcohols with palmitic, stearic and oleic acids have also been identified. The main reaction products were the corresponding diester of 3-chloropropane 1,2-diol followed by monoesters of 3-chloropropane-1,2-diol and esters of 1,3-dichloropropane-2 ol. It was suggested that the same types of compounds could also be present in protein hydrolysates. AA

- 1201 WESSELS (H) and OSTERKAMP (G). Determination of erucic acid in the presence of isomeric docosenoic acids. Fette Seifen Anstrichm. 82(11); 1980; 437-42 (German)

The methyl esters of fatty acids are first fractionated at -25 C on thin layer plates containing silver nitrate. Thus erucic acid (13 cis-docosenoic acid) is separated from isomeric docosenoic acids, such as cetoleic acid (11-cis-docosenoic acid) and trans-docosenoic acids that are frequently found in crude and hydrogenated fish oils. The erucic acid content can be determined by gas chromatography on the eluted fractions after the addition of an internal standard. KMD

- 1202 KATO (M) and TANAKA (T). High-linoleic oils from five species of Japanese plants. J. Am. Oil Chem. Soc. 58(9); 1981; 866-7

Oils extracted from the achenes of *Boehmeria longispica* Steud., *B. spicata* Thunb., and *B. nivea* Gaud. var. *concolor makino* (Urticaceae) and those from the seeds of *Tricyrtis affinis* Makino and *Hosta longipes* Matsum. (Liliaceae) were surveyed for their characteristics and fatty acid composition. All the oils contained linoleic acid in high levels (80.2-83.5%) as determined by gas liquid chromatography of the derived methyl esters. AA

SPICES AND CONDIMENTS

VINEGAR

- 1203 KEARSLEY (MW). Rapid differentiation between vinegars and non-brewed condiments. Part II. J. Assoc. Public Anal. 19(Pt.4); 1981; 121-5

The methods described in Part I of this study to differentiate vinegars from non-brewed condiments were evaluated. Using improved methodology, it was envisaged that differentiation between different vinegars might also be possible. Whilst all vinegars could be differ-

entiated from non-brewed condiments using the improved osmotic pressure/freezing point depression method, and all except spirit vinegars using the ultra-violet absorption method, it was not found possible to differentiate between different vinegars using any of the techniques. AA

- 1204 SÜ (HCF), HORVAT (R) and JILANI (G). Isolation, purification, and characterization of insect repellents from *Curcuma longa* L. J. Agric. Food Chem. 30(2); 1982; 290-92
Two compounds were isolated from *Curcuma longa* L. and identified from their spectral characteristics as 2-methyl-6-(4-methylphenyl)-2-hepten-4-one (α -turmerone) and 2-methyl-6-(4-methyl-1,4-cyclohexadien-1-yl)-2-hepten-4-one (turmerone). α -Turmerone and turmerone gave an average 62.9% (class IV) and 43.1% (class III) repellency, respectively, to *Tribolium castaneum* (Hbst.) after 8 weeks of study. Turmerone was unstable thermally and also at ambient temperature in the presence of air, yielding its dimer or the more stable α -turmerone. AA
- 1205 SINGHAL (PC), GUPTA (RK) and JOSHI (LD). Hypocholesterolemic effect of *Trigonella foenum-graecum* (Methi). Curr. Sci. 51(3); 1982; 136-7
Feeding of diets containing 50% seed of *T. foenum-graecum*, for 2 weeks to normal and hypercholesterolemic rats significantly ($P < 0.0005$) lowered serum cholesterol levels. The total decline in serum cholesterol was 42% and 58% in normal and hypercholesterolemic rats respectively. In normal rats, no risk of hypocholesterolemia was indicated as the final serum cholesterol levels in different rats were close to each other showing the trend towards a constant value. MVG

SENSORY EVALUATION

- 1206 PRICE (S). Chemoreception research in the USSR. Chem. Sense. 6(2); 1981; 63-76
- 1207 PELOSI (P) and PISANELLI (AM). Specific anosmia to 1,8-cineole: The camphor primary odour. Chem. Sense. 6(2); 1981; 87-93
- 1208 KOCH (RB), ROSSI (H) and PRICE (S). Effect of antibody to anisole binding protein on odourant perturbation of Na^+ - K^+ ATPase activity. Chem. Sense. 6(2); 1982; 95-9
- 1209 MAHONY (MO) and HEINTZ (C). Direct magnitude estimation of salt taste intensity with continuous correction for salivary adaptation. Chem. Sense. 6(2); 1981; 101-12
- 1210 IWASAKI (K) and SATO (M). Neural responses and aversion to bitter stimuli in rats. Chem. Sense. 6(2); 1981; 119-28
- 1211 BOUDREAU (JC), ORAVEC (J) and WHITE (TD). A peripheral neural correlate of the human fungiform papillae sweet, bitter sensations. Chem. Sense. 6(2); 1981; 129-41
- 1212 VILLARD (XD), HER (C) and LEOD (PM). Qualitative discrimination of sweet stimuli: Behavioural study on rats. Chem. Sense. 6(2); 1981; 143-8
- 1213 WILLIAMS (AA) and ROSSER (PR). Aroma enhancing effects of ethanol. Chem. Sense. 6(2); 1981; 149-53

- 1214 KOKINI (JL) and DICKIE (A). An attempt to identify and model transient viscoelastic flow in foods.
J. Texture Stud. 12(4); 1981; 539-57
- 1215 OLKKU (J), RHA (C), ROSENAU (JR) and FLETCHER (SW). Texture prediction with a model system.
J. Food Qual. 4(1); 1981; 1-14
- The objective of the present study was to construct a simple model to predict the textural parameters of a product from a texturization process. The system studied was the mixture in which gelatinization of wheat flour takes place in a sugar solution with limited concentration of water (candy licorice type). Statistically significant second order polynomial models with high multiple correlation coefficients and statistically non-significant (at 5% level) lack of fit were obtained for the texture parameters studied. KAR

FOOD STORAGE

Nil

INFESTATION CONTROL AND PESTICIDES

- 1216 HEDIN (PA). New concepts and trends in pesticide chemistry.
J. Agric. Food Chem. 30(2); 1982; 201-15
- Discusses: synthesis of insecticides; biochemical and toxicological studies; natural pest control agents; plant resistance to insects; integrated pest management; trends in herbicides synthesis, formulations and application; biochemical studies on herbicides; weed control mechanism; herbicides from natural products; synthesis of fungicides; biochemical and toxicological studies on fungicides; natural products with fungicidal action; novel pest control mechanisms; surveillance and analysis of pesticides; regulation of plant growth; hazards of pesticides; distribution of pesticides; pest control in the 21st century; industrial trends; and scientific approaches. BSN
- 1217 SANE (RT) and KAMAT (SS). Simple colorimetric method for determination of organothiophosphate insecticides in technical materials and formulations.
J. Assoc. Off. Anal. Chem. 65(1); 1982; 40-42
- A simple colorimetric method based on the reaction of benzophenone with thiophosphate is described. The method is specific for compounds containing the P=S moiety, gives recoveries of $99 \pm 1\%$, and obeys Beer's law for the concentration range 35-350 $\mu\text{g/mL}$. Other sulphur-containing compounds such as sulpha drugs, thiobarbiturate, thiourea, carbon disulphide, and dithiocarbamates do not interfere in the reaction. The method is useful in studying the shelf-life of formulations. AA
- 1218 HODGSON (DW) and WATTS (RR). Accuracy of pesticides reference standard solutions. Part I. Factors affecting organic solvent evaporation.
J. Assoc. Off. Anal. Chem. 65(1); 1982; 89-93
- 1219 HODGSON (DW), THOMPSON (JF) and WATTS (RR). Accuracy of pesticide reference standard solutions. Part II. Chemical stability under four storage conditions.
J. Assoc. Off. Anal. Chem. 65(1); 1982; 94-102
- 1220 HANKS (AR). Gas liquid chromatographic method for analysis of pentachloronitrobenzene formulations.
J. Assoc. Off. Anal. Chem. 65(1); 1982; 110-14

- 1221 KARR (JJ). Gas-liquid chromatographic method for the analysis of microencapsulated diazinon insecticide. *J. Assoc. Off. Anal. Chem.* 65(1); 1982; 115-8
- 1222 DESMARCHELIER (JM). A rapid, colorimetric, procedure for determination of fenitrothion. *J. Environ. Sci. Health.* B16(4); 1981; 419-26
- 1223 CHAKRABARTI (J), MOJUMDER (D) and ROY (BR). Determination of dimethoate and its residues in foods and formulations by gel electrophoresis. *J. Food Sci. Technol. (India).* 19(4); 1982; 142-3
The water soluble organophosphorus pesticide, dimethoate can be identified in food materials by running the hydrolysed product in polyacrylamide gel using citrate buffer (pH 2.4) as chamber buffer. 1% copper sulphate solution is used for staining the band. Quantitation can also be done with the use of densitometer. Minimum detectable limit is 100 µg. The method is simple and quick. KAR
- 1224 RICE (GW), RICHARD (JJ), D'SILVA (AP) and FASSEL (VA). Gas chromatographic-atmospheric pressure active nitrogen method for organomercury speciation in environmental samples. *J. Assoc. Off. Anal. Chem.* 65(1); 1982; 14-9
- 1225 GEORGE (DA). Gas chromatographic determination of residues of oxadiazon and its metabolites in green and dry hops and hop foliage. *J. Assoc. Off. Anal. Chem.* 65(1); 1982; 28-31

BIOCHEMISTRY AND NUTRITION

- 1226 PARK (SH), LEE (SB) and RYU (DDY). Optimization of operating temperature for continuous glucose isomerase reactor system. *Biotechnol. Bioeng.* 23(6); 1981; 1237-54
- 1227 FUJII (M), MURAKAMI (S), YAMADA (Y), ONA (T) and NAKAMURA (T). A kinetic equation for hydrolysis of polysaccharides by mixed exo- and endo-enzyme systems. *Biotechnol. Bioeng.* 23(6); 1981; 1393-8
- 1228 SULLIVAN (JJ) and MAJNARICH (JJ). Hydrolysis of 2-chloroethyl palmitate and 2-chloroethyl linoleate by mammalian enzymes. *J. Food Prot.* 44(2); 1981; 112-4
Ethylene oxide, a well-known fumigant for spices, leaves behind residues of ethylene chlorohydrin. Neither of these two chemicals is present in foods in amounts harmful to human health. But ethylene chlorohydrin can be esterified to 2-chloroethyl palmitate or 2-chloroethyl linoleate. Hence, the authors have studied the hydrolysis of these esters by four enzyme systems, viz., gastric juice, pancreatic juice, intestinal homogenates and liver homogenates. Substantial hydrolysis was observed in all preparations except the artificial gastric juice. Hydrolysis constants ranged from $< 0.001 \text{ min}^{-1}$ in the gastric juice to 0.064 min^{-1} for the linoleate ester in the pancreatic juice. Thus, it is unlikely that significant levels of these esters would remain intact long after ingestion. KMD
- 1229 SMITH (TA) and BEST (GR). The estimation of lysine by a simplified dansylation procedure. *J. Sci. Food Agric.* 32(4); 1981; 378-84
The free lysine estimation mentioned here depends on its reaction with excess dimethylaminonaphthalene sulphonyl (dans) chloride to form dans-5-aminovaleraldehyde. This product is extracted into toluene, separated by thin layer chromatography and estimated by fluorimetry. Recovery percentage is 99. KAR

- 1230 FRIEDRICH (M), UHLIG (J), SCHENK (G) and NOACK (R). Studies on the physiological importance of the microvilli-bound leucine arylamidase in the final digestion of proteins. Part III. The exopeptidatic activities of purified microvilli against peptide mixtures in the presence and after the removal of free amino acids. *Nahrung*. 24(9); 1980; 839-49 (German)

The exopeptidatic degradation of peptide mixtures by the aminopeptidase of the microvilli is inhibited by the presence of free amino acids. Further degradation occurs after the removal of the free amino acids from the peptide mixture. The amino acid composition of the remaining residual peptides is a second factor that impedes the complete cleavage of the peptides. AA

- 1231 LINDNER-SZOTYORI (K) and GERGELY (A). On the supply of some essential trace elements to the Hungarian population. *Nahrung*. 24(9); 1980; 829-37 (German)

The authors determined the copper, zinc, chromium, cobalt, manganese, iron and nickel contents of 703 samples of animal foods (meat offals, milk, eggs) from different parts of Hungary and of 370 samples of fruits and vegetables. Calculations based on consumption data from the Central Board of Statistics showed that the copper and iron intakes of the population are lower than those suggested by the FAO/WHO. When infants are given exclusively ready-to-use baby foods produced exclusively on milk, their supply is still less favourable, as they supply not more than 10-15% of the prescribed copper and of 20-35% of iron. AA

- 1232 MORCK (TA) and COOK (JD). Factors affecting the bioavailability of dietary iron. *Cereal Food World*. 26(12); 1981; 667-72

Sources of dietary iron; predicting the bioavailability of dietary iron; dietary components affecting bioavailability; enhances of bioavailability including ascorbic acid and animal tissue; inhibitors of bioavailability including tea, coffee, soy products, EDTA, calcium/phosphates, eggs, wheat bran and fibre; and model for estimating bioavailability. KAR

- 1233 CASEY (PJ), SPECKMAN (KR), EBERT (FJ) and HOBBS (WE). Radioisotope dilution technique for determination of vitamin B₁₂ in foods. *J. Assoc. Off. Anal. Chem.* 65(1); 1982; 85-8

The technique combines a standard extraction procedure (AOAC 43.108, 12th ed.) with a commercially available Radioisotope dilution (RID) assay kit. Average recoveries obtained were 98.1% for fortified food products and 95.8% for unfortified food products; and the relative standard deviations (of reproducibility data) were 6.9% and 9.2% respectively. The mean vitamin B₁₂ content of the products tested was found to be 8.01 µg/100g. When the RID method was used, and 7.54 µg/100g when the AOAC microbiological method was used; the correlation coefficient was $r = 0.983$. KMD

- 1234 HANSEN (RG), WYSE (B) and WINDHAM (C). Balancing nutrient intake with calories. *Cereal Food World* 26(12); 1981; 674-8

- 1235 RAJAMMAL DEVADAS (P), KAMALANATHAN (G) and VIJAYALAKSHMI (P). Leaf protein feeding trials with preschool children at Coimbatore. III. Composition and nutritive value of the various supplements based on their home diets. *Indian J. Nutr. Dietet.* 18(9); 1981; 323-7

The formulation of the various supplements and the basal diet was planned on the basis of home diets of the children. Since the daily dietary deficit ranged from 300-500 cal. and five grams of protein it was decided to increase the protein consumption by 10g from different protein supplements. The protein and the energy consumption by the children in the supplemented groups were on par with the recommended allowances. AA

- 236 ANON. Prostaglandins in human milk.
Nutr. Rev. 39(8); 1981; 302-3
- 237 ANON. The nutritional value of breast milk from non-pregnant mothers.
Nutr. Rev. 39(8); 1981; 308-9
- 238 LUYKEN (R), REP (BH), van BEERS (S) and BERTENS (A). Influence of experimental hook-work, infestation on some chemical parameters of the nutritional status.
Voeding. 41(7); 1980; 259
- 1239 Van STAVEREN (WA) and HULSHOF (KFAM). Individual dietary survey methods: Possibilities and limitations.
Voeding. 41(6); 1980; 228-33
- 1240 KROMHOUT (D). Is the present day diet a prudent diet?
Voeding. 41(7); 1980; 255-8
It would be prudent to modify the Dutch diet as follows: lower the intake of meat and meat products, dairy products, eggs, low-PUFA margarines and cooking fats, sugar, soft drinks, cakes, sweets, and salt; increase the intake of bread, potatoes, pulses, vegetables, fruits, high-PUFA margarines and cooking oils, nuts, and fish. KMD
- 1241 DEURENBERG (P) and KASTERMANS (J). The influence of a low fat, carbohydrate-rich diet on the lipid level in the blood of young women.
Voeding. 41(8); 1980; 284-8
When young, free-living female volunteers were fed on a fat-limited ($\leq 15\%$ of total energy) and carbohydrate-rich diet for 12 weeks, their serum cholesterol dropped from 4.5 to 4.1 mmol/l. Decreases were measured in both the HDL and LDL fractions, and could be predicted by the formula of Keys. The intake of linoleic acid through the diet was minimal - just 1% of energy. Although the intake of oligosaccharides was constant, serum triglyceride levels increased. The fasting insulin level was significantly lower during the experimental period. Energy consumption of all the volunteers was less (by 13%) during the experiment, and they lost also about 1.1 kg in body weight. KMD
- 1242 WHITE (PL) and CROCCO (SC). Hypertension: A sodium related problem?
Cereal Food World. 26(2); 1981; 61-3
- 1243 ANON. Experimental myocardial infraction and fish oil.
Nutr. Rev. 39(8); 1981; 316-7

TOXICOLOGY AND HYGIENE

- 1244 ADACHI (K). Mass fragmentographic determination of polymethylbiphenyl in foods contaminated with petroleum products.
Bull. Environ. Contam. Toxicol. 26(6); 1981; 737-44
- 1245 DUNSMORE (DG), THOMSON (MA) and MURRAY (G). Bacteriological control of food equipment surfaces by cleaning systems. III. Complementary cleaning.
J. Food Prot. 44(2); 1981; 100-8
The experiment demonstrated that the complementary use of alkaline and acidic detergents is ineffective in the soak-cleaning situation as acidic detergents aggravate accumulation of soil under these circumstances. AA
- 1246 BRYAN (FL), HARVEY (M) and MISUP (MC). Hazard analysis of party-pack foods prepared at a catering establishment.
J. Food Prot. 44(2); 1981; 118-23, 127
Foods prepared by a catering establishment were implicated as vehicles in five outbreaks of foodborne disease. Because of this, a

hazard analysis was conducted consisting of (a) evaluation of product temperatures throughout processing and assembly, (b) pH measurements of the salad products and (c) testing samples of the products taken at various stages of processing for pathogenic foodborne bacteria. Guidelines for caterers and party hosts and hostesses are recommended.
AA

- 1247 DENNY (CB). Thermophilic organisms involved in food spoilage. Introduction.
J. Food Prot. 44(2); 1981; 144-5
- 1248 ASHTON (DH). Thermophilic organisms involved in food spoilage: Thermophilic anaerobes not producing hydrogen sulphide.
J. Food Prot. 44(2); 1981; 146-8
- 1249 SPECK (RV). Thermophilic organisms in food spoilage: Sulphide spoilage anaerobes.
J. Food Prot. 44(2); 1981; 149-53
- 1250 THOMPSON (PF). Thermophilic organisms involved in food spoilage: Aciduric flat-sour sporeforming aerobes.
J. Food Prot. 44(2); 1981; 154-6
- 1251 ITO (KA). Thermophilic organisms in food spoilage: Flat-sour aerobes.
J. Food Prot. 44(2); 1981; 157-63
- 1252 OEHLER (DD), GINGRICH (RE) and HAUFLE (M). High-performance liquid chromatographic determination of β -exotoxin produced by the bacterium *Bacillus thuringiensis*.
J. Agric. Food Chem. 30(2); 1982; 407-8
- 1253 SHARPE (AN), PETERKIN (PI) and RAYMAN (MK). Detection of *Escherichia coli* in foods: Indole staining methods for cellulosic and polysulphone membrane filters.
Appl. Environ. Microbiol. 41(6); 1981; 1310-15
- 1254 NG (TK), BEN-BASSAT (A) and ZEIKUS (JG). Ethanol production by thermophilic bacteria: Fermentation of cellulosic substrates by cocultures of *Clostridium thermocellum* and *Clostridium thermohydrosulphuricum*.
Appl. Environ. Microbiol. 41(6); 1981; 1337-43
- 1255 HARRACH (B), MIROCHA (CJ), PATHRE (SV) and PALYUSIK (M). Macrocyclic trichothecene toxins produced by a strain of *Stachybotrys atra* from Hungary.
Appl. Environ. Microbiol. 41(6); 1981; 1428-32
- 1256 DICKIE (N) and AKHTAR (SM). Improved radio-immunoassay of staphylococcal enterotoxin A.
J. Assoc. Off. Anal. Chem. 65(1); 1982; 180-84
A simple solid-phase radioimmunoassay was developed for detecting staphylococcal enterotoxin A (SEA) in food. The method detected 85-100% SEA added to extracts of 6 kinds of foods, and 52-100% SEA added directly to foods at a concentration of 1 ng/g. Assay sensitivity is about 0.3 ng toxin/mL extract. The method is specific for SEA; results are only marginally affected by staphylococcal enterotoxins B and C₂ present at concentrations as high as 500 ng/mL extract. AA
- 1257 RESTAINO (L) and HILL (WM). Antibiotic susceptibility patterns of *Yersinia enterocolitica*.
J. Food Prot. 44(2); 1981; 124-7

- 258 SUBRAMANIAN (T). Colorimetric determination of patulin produced by *Penicillium patulum*.
J. Assoc. Off. Anal. Chem. 65(1); 1982; 5-7

The fungus was grown separately in well defined liquid minimal medium, and on rice and bread, for 15 days. Patulin was extracted with ethyl ether and determined colorimetrically, using phenylhydrazine hydrochloride. Recovery of pure patulin added to rice and bread was also studied. The lower limit of detection was 1 $\mu\text{g/g}$. KMD

- 1259 PESTKA (JJ), STEINERT (BW) and CHU (FS). Enzyme-linked immunosorbent assay for detection of ochratoxin A.
Appl. Environ. Microbiol. 41(6); 1981; 1472-4

I N D E X

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GENERAL

- 1260 KARLESKIND (A). Study of the functioning, evolution, and cost of laboratories in the agro-food industries (Interest of sub-contracting). Ind. Aliment. Agric. 97(10); 1980; 1001-6
The different types of laboratory controls that exist in the food industry have been described. Next, the conditions of operation and the costs of quality control laboratories have been dealt with. The risks of costs of having one's own laboratory have been compared with those of sub-contracting the quality control work; the latter alternative is of particular interest in the light of the new Public Service Projects. KMD
- 1261 LE BEAULT (J-M). Biotechnology, a framework for innovation in agro-food industries. Ind. Aliment. Agric. 97(10); 1980; 1045-9 (French)
- 1262 PRUDHOMME (J). Human factors and productivity in the food and agricultural industries. Ind. Aliment. Agric. 97(12); 1980; 1325-9 (French)
Productivity is not merely a consequence of the speed of the engine. It is close linked to the social environment, careful and detailed supervision of direct manpower, strict calculation of standards, innovation in work-schedule, and a permanent process of analysis. KMD
- 1263 DESJARDINS (M) and SARDET (D). Sensors in the agro-food industries. Ind. Aliment. Agric. 97(10); 1980; 1011-4 (French)
- 1264 SARIS (WHM). Top sportsmen and filled cakes. Voeding. 41(11); 1980; 399-402
- 1265 BLANCHFIELD (JR). The philosophy of food control. Food Technol. 35(4); 1981; 49-51
Author first defines what is food control and what is quality and further describes the constraints in food control and how it interfaces with other functions and the role of managerial skills. KAR
- 1266 LYONS (RL). A commercial application of quality control. Food Technol. 35(4); 1981; 52-3
- 1267 KRAGT (M). Quality control of raw materials and vendor relations. Food Technol. 35(4); 1981; 54-5
- 1268 KRAMER (A). Application of statistics to quality control. Food Technol. 35(4); 1981; 56-7, 59
Some of the aspects covered include statistical quality control through computers aid analysis, sampling plants, and optimization techniques. KAR
- 1269 De FIGUEIREDO (MP). Quality assurance of food safety. Food Technol. 35(4); 1981; 58-9
- 1270 SOSA JACOB. A study of food allergy in South India. Indian J. Nutr. Dietet. 18(10); 1981; 353-9
50 families chosen by stratified random sampling procedures were studied in Vellore town with a view to determine the prevalence and characteristics of food allergies. One-fifth of families had cases of food allergy. In terms of individuals, 11 out of 348 individuals had some food allergy, giving the incidence of allergy, as 3%. The main allergic manifestations encountered were rash, abdominal pain, indigestion diarrhoea, nausea, vomiting, fainting, giddiness, headaches and breathlessness. Foods incriminated included wheat, green chillies, brinjal, banana and gingelly oil. The findings are discussed in the light of existing knowledge on etiology of food allergy. The need for further studies is emphasized. AA

- 1271 ANON. Exports of agricultural commodities.
Indian J. Agric. Econ. 37(3); 1982; 294-345
The issue contains full texts of 6 papers, summaries of 13 papers and the report of the rapporteur. KMD
- 1272 GILL (SS) and GHUMAN (RS). India's agricultural exports: Performance and some policy issues.
Indian J. Agric. Econ. 37(3); 1982; 294-300
The paper deals with the broad trends of Indian exports upto 1979 in commodities like tea, cashew kernels, spices, tobacco, oil cakes, cotton (raw and waste) and coffee. Policy aspects on India's exports of agricultural produce have also been covered. KMD
- 1273 GUPTA (T) and GULERIA (A). India's exports of non-wood forest products and their potential role in agricultural development.
Indian J. Agric. Econ. 37(3); 1982; 311-6
The non-wood products covered include oilseeds, fruits, resins, barks, leaves, exudates and animal products. KMD

FOOD PROCESSING AND PACKAGING

- 1274 NETO (ROT). Heat transfer rates to liquid foods during flame sterilization.
J. Food Sci. 47(2); 1982; 476-81
- 1275 HAYAKAWA (K-I) and SUCCAR (J). Heat transfer and moisture loss of spherical fresh produce.
J. Food Sci. 47(2); 1982; 596-605
- 1276 SUCCAR (J) and HAYAKAWA (K-I). Prediction of time correction factor for come-up heating of packaged liquid food.
J. Food Sci. 47(2); 1982; 614-8
All physical properties and operational conditions which have an influence on the come-up heating correction factor (C_f), of packaged liquid food were examined and subjected to a dimensional analysis. Five dimensionless groups which uniquely define the correction factor were obtained. The influence of the parameters on the values of C_f was studied through application of a central composite experimental design and a nonlinear regression analysis, from which a regression equation for the prediction of the correction factor was obtained. It was found that the C_f values may vary between +0.86 to -0.37, having an average value of 0.31. Mathematical examination of the regression equation obtained indicates that a dimensionless group which is related to the temperature history of the heating medium during the come-up phase is the most important in determining the value of C_f , while another which is a function of the processing time has a negligible influence on this parameter. The reliability of our regression equation was verified experimentally with distilled water, 0.1% locust bean gum and tomato soup packed in cans 211 x 300 and 307 x 409. Good agreement between experimental and predicted C_f values was observed. AA
- 1277 CUEVAS (R), CHERYAN (M) and PORTER (VL). Performance of a scraped-surface heat exchanger under ultra high temperature conditions: A dimensional analysis.
J. Food Sci. 47(2); 1982; 619-25, 641
Performance characteristics of a pilot-scale scraped-surface heat exchanger (Contherm Model 6 x 2) under UHT operating conditions were evaluated. Outlet temperature and overall heat transfer coefficient (U) were significantly affected by rotational speed of the blades, mass flow rate of feed, feed inlet temperature, steam pressure and solids content of the model low-acid liquid food (soy extracts). The scraping action of the blades greatly improved the performance up to about 350 rpm; higher blade speeds had little or no effect and sometimes decrea-

sed U values. Application of dimensionless models showed that the effect of axial Reynolds number (Re_A) on the Nusselt number was more significant in the turbulent regime ($Re_A > 1800$), while rotational Reynolds number above 10^5 had a significant effect at all values of Re_A between 1200 and 3700. At very high values of the Taylor number ($> 10^{10}$) when laminar axial flow conditions prevailed, Nusselt number decreased with increase in rotational Reynolds number. AA

- 1278 SMITH (T) and TUNG (MA). Comparison of formula methods for calculating thermal process lethality.

J. Food Sci. 47(2); 1982; 626-30

Accuracy of five formula methods for determining process lethality in conduction heating foods was examined. Finite-difference simulation was used to generate temperature history curves for a range of cans and processing conditions. Delivered lethality was evaluated using the formula methods and compared to the lethality calculated using a numerical general method. Deviations exhibited trends related to container dimensions and unaccomplished temperature difference (g), the largest errors occurring when g was large and the height-to-diameter ratio was close to unity. Errors were mostly on the "safe" side, but the energy use implications could be significant for high retort temperature processes. AA

- 1279 GIANNONI-SUCCAR (EB) and HAYAKAWA (K-I). Correction factor of deviant thermal processes applied to packaged heat conduction food.

J. Food Sci. 47(2); 1982; 642-6

A procedure was developed to estimate the values of correction factor, C_f , for deviant thermal processes applied to canned or other packaged heat conduction food. Sterilizing values at the thermal center of the food were used as a criterion for this estimation. In this procedure, empirical heat transfer parameters, f and j values, were used to estimate C_f values. The developed procedure is based on the use of a regression equation, which was obtained through the dimensional and statistical analyses of theoretically determined C_f values. According to a series of experiments which were performed by using 307 x 409 and 211 x 300 cans of 8% bentonite suspension, there was reasonably good agreement if C_f values estimated theoretically and determined experimentally. AA

- 1280 MENDEZ-COTERA (G) and MICHELS (L). Sterilization by steam of solid foods in bulk.

Ind. Aliment. Agric. 97(10); 1980; 1059-65 (French)

Solid foods in bulk may be sterilized by using techniques applied to fluid foods, e.g. HTST processes. It is pointed out that non-condensable gases and the downward flowing condensed steam may reduce the rate of heat transfer. It is also of great importance to determine the coldest point of the mass, in other words, the zone that is most difficult to heat, when developing such a method. KMD

- 1281 HERSOM (AC) and SHORE (DT). Aseptic processing of foods comprising sauce and solids.

Food Technol. 35(5); 1981; 53-62

The article describes the development of a process and equipment to overcome some of the problems faced in aseptic processing of foods. The process has been applied commercially in a prototype system successfully operating in a European plant. KAR

- 1282 BRAMSNAES (F). Maintaining the quality of frozen foods during distribution.

Food Technol. 35(4); 1981; 38-43

The various aspects covered include product temperature during distribution, effect of temperature on quality, possibilities of improving quality, and possible deviations in time-temperature tolerance. KAR

- 1283 STARON (T), THIROUIN (D), PERRIN (L) and FRERE (G). Treatment of biological food products by micro-waves.
Ind. Aliment. Agric. 97(12); 1980; 1305-12 (French)

The authors have reported the results of their studies on various applications of micro-waves, including: (i) micro-wave cooking of foods, and the nutritional value of such foods; (ii) drying by micro-waves; (iii) extraction (of water, sugar, oil, protein) after micro-wave treatment (iv) asepsitization of biological products; (v) cellular thermolysis, (vi) homogenization; (vii) stabilization of citrus juices; and (viii) cooking of rice. On the whole, micro-wave treatment results in foods that are more healthy and nutritious. KMD

- 1284 McDERMOTT (RL), HARPER (WJ) and WHITLEY (R). A centrifugal method for characterization of salad dressing emulsions.
Food Technol. 35(5); 1981; 81-8

After describing the centrifugal method using the dye, the authors have pointed out the effect of dye on emulsion characteristics, effect of varying centrifugation time, and derived expression for emulsion volume index and emulsion rating. KAR

- 1285 BISCHOFF (E). Considerations on the future of plastic packaging of food.
Gordian. 80(12); 1980; 298-302

FOOD ENGINEERING AND EQUIPMENT

- 1286 PALLMANN (H). Comminution technology in the food industry.
Gordian. 80(12); 1980; 306-10 (German)

The mechanical principles on which ten different types of mills, work have been explained, and their capabilities and applications mentioned. KMD

- 1287 BLEZA (J). Synthesis of automation in the agricultural and food industries.
Ind. Aliment. Agric. 97(10); 1980; 1017-21 (French)

- 1288 ILARI (J-L). Ignorance of certain physical properties. A dark point for the food industries.
Ind. Aliment. Agric. 97(10); 1980; 993-8 (French)

The insufficient knowledge of physical properties of foodstuffs, which is a handicap for food industry, has been pointed out by the author. This view is supported by a brief investigation of three areas: physical properties of food powders, physical state of products and behaviour of products near the sensors. AA

- 1289 LUCAS (JC). Asepsis of air by filtration; The absolute filter.
Ind. Aliment. Agric. 97(10); 1980; 1023-30

- 1290 DUNSMORE (DG), TWOMEY (A), WHITTLESTONE (WG) and MORGAN (HW). Design and performance of systems for cleaning product contact surfaces of food equipment: A review.
J. Food Prot. 44(3); 1981; 220-40

This paper reviews the routine and periodic systems used to clean food equipment. The manner in which soil accumulates on surfaces, and factors affecting that accumulation are discussed. The mechanisms by which microbial development on the equipment surface is controlled by the system is also discussed. The contamination sequence of deposition, attachment, depletion, growth and contamination by the organism is presented in detail. Changes in surface microbial numbers over time are reviewed for system components and complete systems. The relationship between the amount of soil on the surface and microbial survival is examined. The ability of the routine and periodic systems to control soil accumulation and microbial development is discussed.

Factors affecting design of a cleaning system are also presented. These factors are used to design a cleaning system, using a pipeline milking machine as an example. AA

- 1291 TATTERSON (GB). Scale-up procedures and power consumption in agitated vessels.

Food Technol. 35(5); 1981; 65-70

Some of the more accepted procedures provided by users and manufacturers of agitation equipment have been reviewed and compared with those provided by academic community. Power consumption in the trailing vortex systems has been stressed and reviewed. KAR

ENERGY IN FOOD PROCESSING

- 1292 ESTABLE (M). Role of the person in charge of "ENERGY".

Ind. Aliment. Agric. 97(10); 1980; 1033-9 (French)

- 1293 CARROAD (PA). A modified dollar-rationing approach for choosing among process energy alternatives.

Food Technol. 35(4); 1981; 69-74

The article draws attention to a recognized method for rationing capital or money among competing projects for investment. KAR

FOOD CHEMISTRY AND ANALYSIS

- 1294 CHIRIFE (J) and FERRO FONTAN (C). Water activity of fresh foods.

J. Food Sci. 47(2); 1982; 661-3

This work presents a compilation of water activity (a_w) values for fresh foods namely fruits, vegetables and meats. Water activities were calculated from reported data on the cryoscopic temperature (or initial freezing point) of fruits, vegetables and meats, amounting to eighty six different items. In practically all cases studied, the water activity is in the range 0.970-0.996. AA

- 1295 GOLDBERG (I) and Er-el (Z). The chemostat. An efficient technique for medium optimization.

Process Biochem. 16(6); 1981; 2-4,6-8

Discusses: continuous culture operation relevant to medium optimization; techniques and some modifications; and media optimization for biomass and product formation. BSN

- 1296 STRUNK (DH), AICKEN (JC), HAMMAN (JW) and ANDREASEN (AA). Density meter determination of proof of ethanol-water solutions.

J. Assoc. Off. Anal. Chem. 65(2); 1982; 218-23

Density meter procedures and the official AOAC pycnometer method to measure proof of ethanol-water solutions in the 25-79° proof range were collaboratively studied. Measurement of proof by density meter is simpler, requires less time and smaller samples, and gives more reproducible results than the AOAC pycnometer method. Differences of -0.05 to +0.02° proof between averages of results reported for density meter and pycnometer are acceptable, considering that proof of finished alcohol products is reported to 0.1°. The density meter method has been adopted official first action. AA

- 1297 WINKLER (FJ) and SCHMIDT (HL). Scope of the application of ^{13}C isotope mass spectrometry in food analysis.

Z. Lebensmittel-Unters. Forsch. 171(2); 1980; 85-94 (German)

The content of stable and naturally radioactive isotopes in food is often typical of its origin and manufacturing. On the basis of a classifying review of results from the last decade, the possibilities of corresponding measurements are demonstrated. The majority of these

studies deal with ^{13}C analysis and mainly concern products as sugar, honey, syrup, vinegar, ethanol, and spirituous liquors. Furthermore data on beer, oils, fats, meats, dairy products, eggs and some additives are presented. The most important application is the differentiation between products originating from maize, and/or sugarcane ("heavy" plants or C_4 plants) and products from the other major cultivated plants ("light" plants or C_3 plants). Standard deviations and detection limits as well as future possibilities, mainly concerning the determination of nitrogen and sulphur isotopes are discussed. AA

- 1298 CAMIRE (AL) and CLYDESDALE (FM). Analysis of phytic acid in foods by HPLC.

J. Food Sci. 47(2); 1982; 575-8

A quantitative HPLC method for the analysis of phytic acid in foods was developed based on the precipitation of phytic acid with ferric chloride followed by conversion to sodium phytate before injection onto a C_{18} reversed-phase column. Standard food grade wheat bran samples were analyzed by the method of standard addition and recovery of phytic acid ranged from 99-103%. 3% H_2SO_4 was found to be as effective as 3% TCA in the extraction of phytic acid. AAS was shown to be potentially valuable as a metal specific detector for the HPLC of phytate-metal complexes. AA

FOOD LAWS AND REGULATIONS

- 1299 STRIBLING (JH) Jr. Food labelling: Who's responsible for assuring its truthfulness?
Food Drug Cosmet. Law J. 37(3); 1982; 251-6
- 1300 KORWEK (EL). FDA regulation of biotechnology as a new method of manufacture.
Food Drug. Cosmet. Law J. 37(3); 1982; 289-309

FOOD MICROBIOLOGY

- 1301 SODECK (G), MODL (J), KOMINEK (MJ) and SALZ-BRUNN (W). Production of citric acid according to the submerged fermentation process.
Process Biochem. 16(6); 1981; 9-11
Discusses: surface fermentation process; submerged fermentation process; comparison of the two processes; and separation of citric acid from fermentation mashes and purification. BSN
- 1302 DURIC (N). A new approach in bioreactor design.
Process Biochem. 16(6); 1981; 20-22
- 1303 BARET (J-L). Development of the hydrolysis of lactose by immobilized lactase.
Ind. Aliment. Agric. 97(10); 1980; 1051-5 (French)
Recent progresses in the development of lactose hydrolysis with immobilized lactase processes are reviewed. The various routes to obtain lactolyzed products from dairy byproducts are considered. The applications of the end syrups and production economics are discussed. It appears that these products can play an important role on the market of industrial sweeteners. AA
- 1304 GANDHI (AP). Studies on the production of α -amylase by *Bacillus subtilis* growing in the batch and chemostat cultures.
J. Food Sci. Technol. (India). 19(5); 1982; 177-181
Production of α -amylase by *Bacillus subtilis* NCIB 8646 was investigated in batch and continuous cultures on a synthetic medium. In batch cultures, the rate of α -amylase synthesis reached the maximum in

postlogarithmic phase. The exogenous additions of glucose and acetic acid to control the pH increased significantly the cell yields and the enzyme forming system. In chemostat cultures, the maximum synthesis of α -amylase was associated with carbon limited growth rate at a dilution rate of $0.2/h^{-1}$. α -amylase was also induced in nutrient limitations other than the carbon limitation. Higher concentrations of glucose in the medium severely repressed the enzyme forming system. It supports the earlier view on the catabolic repression of this enzyme system. Glucose and soluble starch induced a higher enzyme forming system. Organic N sources yielded more active amylase than the inorganic N sources. AA

- 1305 ISHII (K) and UENO (Y). Isolation and characterization of two new trichothecenes from *Fusarium sporotrichioides* strain M-1-1. Appl. Environ. Microbiol. 42(3); 1981; 541-3

YEAST

- 1306 LUTHER (H) and SCHUSTER (E). Studies on the characterization of the mechanical digestion of *Saccharomyces cerevisiae*. Nahrung. 24(10); 1980; 981-8 (German)

The mechanical cell digestion is an essential stage of the process of protein isolation from microorganisms. Its characterization requires the determination of the degree of digestion as well as that of the extent of cell disintegration. By the example of ultrasonic digestion, or digestion by means of a ball mill, it is shown that the change in conductivity (because of its high significance) is an appropriate parameter for determining the degree of digestion. A reaction of the first order describes the mechanical digestion of the cells. The calculation of rate constants and half life periods serves to evaluate the effectiveness of the digestion procedure. The extent of cell disintegration may be characterized qualitatively by conductometric particle counting, turbidity measurements and examinations with the light microscope. AA

- 1307 PACA (J). Multistream oxygen supply into a multistage tower fermenter during continuous yeast cultivations. Process Biochem. 16(6); 1981; 40-43,46

ALGAE

- 1308 STRATTON (GW) and CORKE (CT). Interaction between acetone and two pesticides towards several unicellular green algae. Bull. Environ. Contam. Toxicol. 27(1); 1981; 13-6

- 1309 WU (JF) and POND (WG). Amino acid composition and microbial contamination of *Spirulina maxima*, a blue-green alga, grown on the effluent of different fermented animal wastes. Bull. Environ. Contam. Toxicol. 27(2); 1981; 151-9

MUSHROOM

- 1310 NEY (KH) and FREYTAG (WG). Aroma of edible flat mushrooms (*Boletus edulis*). Gordian. 80(12); 1980; 304-5

The volatile, flavour components of dehydrated flat mushrooms have been identified and estimated semi-quantitatively. They include 11 acids, 4 phenols, 8 amines, 10 alcohols, 1 ketone, and 3 sulphur compounds. 1-octene-3-one was found to be the essential flavour component of flat mushrooms. KMD

FOOD ADDITIVES

- 1311 SMOOT (LA) and PIERSON (MD). Mechanisms of sorbate inhibition of *Bacillus cereus* T and *Clostridium botulinum* 62A spore germination. Appl. Environ. Microbiol. 42(3); 1981; 477-83
- 1312 HALL (RL) and MERWIN (EJ). The role of flavours in food processing. Food Technol. 35(6); 1981; 46-8,50-52
The review covers historical aspect of flavours, categories of flavours; development of modern flavours, food categories and use of flavours, per capita use of flavours in USA, functional roles of flavours and the technical, economic and human effects of flavours. KAR
- 1313 TORRES (A) and THOMAS (RD). Polydextrose and its applications in foods. Food Technol. 35(7); 1981; 44-9
The various aspects covered are; product description, properties, human tolerance, regulatory status, functional characteristics, applications in hard candy, peanut brittle, caramel and toffee, gumdrops, nougat, marshmallows, chewing gum, frostings, frozen desserts, gelatin dessert, puddings, baked goods, pourable salad dressings, and opportunity for product development. KAR
- 1314 SANDERSON (GR). Polysaccharides in foods. Food Technol. 35(7); 1981; 50-52,54-7,83
After briefly describing the functional properties, like thickening, stabilization, gel formation and emulsification, the author describes the major food polysaccharides which include starch, cellulose derivatives, gum exudates, seed gums, pectins and xanthan gum. KAR

CEREALS

- 1315 VAIDEHI (MP) and ANNAPURNA (RG). Protein quality of extrusion cooked cereal based weaning foods in Wistar Strain Albino rats. Nutr. Rep. Int. 23(2); 1981; 363-70
No significant difference was observed between the mixed cereal extrusion cooked weaning food and a proprietary popular weaning food in protein quality and growth promoting value in rats. KAR
- 1316 ZYGMUNT (LC). High-pressure liquid chromatographic determination of mono- and disaccharides in pre-sweetened cereals. J. Assoc. Off. Anal. Chem. 65(2); 1982; 256-64
A modified A.O.A.C. method (sugars in chocolate) was used for the determination of glucose, fructose, sucrose, and maltose in pre-sweetened cereals by HPLC. Eight samples, consisting of 6 products, were analyzed in duplicate by the HPLC and the AOAC Lane-Eynon method. The AOAC method was modified to use water-alcohol (1+1) and Sep-Pak C₁₈ cartridges for sample cleanup. The precision of the HPLC method was found to be comparable to that of the Lane-Eynon method; the modified HPLC method has therefore been adopted as official first action. KMD
- 1317 MONGEAU (R) and BRASSARD (R). Determination of neutral detergent fiber in breakfast cereals: Pentose, hemicellulose, cellulose and lignin Content. J. Food Sci. 47(2); 1982; 550-55

RICE

- 1318 BHATTACHARYA (KR), SOWBHAGYA (CM) and INDUDHARA SWAMY (YM). Quality profiles of rice: A tentative scheme for classification. J. Food Sci. 47(2); 1982; 564-9

Based on a study of 177 samples, rice varieties could be tentatively classified into eight quality types, primarily on the basis of total and hot-water-insoluble amylose contents and viscogram pattern. Rice of type I (high total and insoluble amylose) cooked very hard and flaky, while that of type VIII (waxy, negligible amylose) cooked very soft and sticky. Gelatinization temperature (GT) could be indexed by either alkali score or water-uptake ratio or soluble-amylose ratio. Equilibrium moisture attained by rice upon soaking was a combined function of the amylose content, the GT, and kernel chalkiness. The viscogram pattern was largely, but not wholly, a function of the amylose. Protein content was not related to other properties. AA

- 1319 TOLSTOGUZOV (VB), LEMISOVA (LV), CHIMIROV (Ju.I), BRAUDO (EE), TSURJAPKIN (VA), VOLNOVA (AI) and KOZMINA (EP). Artificial groats from rice-processing byproducts. Nahrung. 24(10); 1980; 951-62

Broken rice and rice dust middlings are valuable raw materials to be used in food industry. The protein content increases in the following order: white rice < broken rice < rice dust middlings. The content of lysine and sulphur-bearing amino acids in protein increases in the same order. The rice dust middling protein substantially differs from white rice protein by its fractional composition. This protein is balanced with regard to all essential amino acids except tryptophane. A method has been developed to process broken rice and rice dust middlings into artificial groats. Casein is added to increase biological value of groat. The broken rice groats possess good technological properties. Meals made from these groats have organoleptic properties similar to the properties of natural rice. The rice dust middling groats have inferior technological properties as compared to broken rice. The biological value of artificial groats is much higher than that of natural rice. In these aspects, they are similar to or even better than casein. AA

- 1320 PILLAIYAR (P) and MOHANDOSS (R). On the completion of cooking in rice. Indian J. Nutr. Dietet. 18(11); 1981; 385-90

For determining the variations in cooking qualities of different rice samples, they are cooked to their optimal cooking times. The disappearance of opaque-core forms the basis for indicating the completion of cooking. In severely parboiled samples, there is no sign of opaque-core even in five minutes cooking and therefore, the determination of optimal cooking time for such samples has no relevance. Moreover, in certain samples, even while completing the cooking with reference to the disappearance of opaque-core, the rice is to be cooked still further to attain the desired tenderness. Thus, the existing reference point i.e. the disappearance of opaque-core for indicating the completion of cooking has its own limitations. An alternative method with reference to the area of the cooked rice after pressing it by momentarily dropping 2.5 kg load in a dropping device and comparing with that of the standards sample is indicated. To get a similar tenderness for their respective cooked raw rice samples, the severely parboiled rices are to be cooked for a prolonged period twice or thrice the time required for raw samples. Positive correlation exists between the equilibrium moisture content attained by rice upon soaking in water at room temperature (EMC-S) and the time taken for cooking to the desired tendernees as indicated by the suggested test. AA

- 1321 SHARP (RN), SHARP (CQ) and KATTAN (AN). A new method for thermally processed canned rice. Food Technol. 35(5); 1981; 75-8

An acceptable canned rice product has been developed which eliminates precanning steps such as soaking and/or precooking. The pH of the product should be 4.6. The process is simple, requires minimal

labour and equipment. The data suggest that 211 x 400 size cans optimally require 55-60 g of non-hydrated, parboiled milled rice, 16% citric acid (w/v) and a 45 minute processing time at 100 C. KAR

MILLETS

- 1322 VINCENT MONTEIRO (P). Nonstarchy polysaccharides of Italian millet. *J. Food Sci. Technol. (India)* 19(5); 1982; 208-9
- Nonstarchy polysaccharides (NSP) content in 14 varieties of Italian millet ranged from 1.22 to 2.23% of the dehulled grain. Water-soluble and alkali-soluble NSPs of the 2 varieties of the millet were isolated and partially characterized. The yield of alkali-soluble NSP is approximately 6 times more than the water-soluble NSP. All the NSP preparations contained glucose, galactose, arabinose and xylose. The total carbohydrates in the two varieties were 68 and 82.5% respectively. The ratio of pentoses to hexoses in the NSP preparations was nearly unity. AA

FINGER MILLET

- 1323 MALLESHI (NG) and DESIKACHAR (HSR). Formulation of weaning food with low hot paste viscosity based on malted ragi (*Eleusine Coracana*) and green gram (*Phaseolus radiatus*). *J. Food Sci. Technol. (India)* 19(5); 1982; 193-7
- (i) Ragi (*Eleusine coracana*) and (ii) green gram (*Phaseolus radiatus*) were steeped in water for 24 to 96 hours and the elaboration of amylase and its activity and the paste viscosity pattern were determined. (i) and (ii) after 16 hours of steeping were germinated for 48 and 24 hours respectively, dried and powdered after the removal of the vegetative portion and bran and mixed at 70:30 proportion to produce a malted weaning food (MWF). Significant increase in amylase activity and decrease in paste viscosity occurred with progressive germination of (i) and (ii). (i) showed higher enzymic and viscosity changes than (ii). Hot paste viscosity of MWF was much lower than that of some proprietary brands of weaning foods at 15% slurry concentration. It was found that hot paste viscosity of some weaning foods sold in Indian market could be reduced by the addition of 5% malted barley powder. KAR

MAIZE

- 1324 TRIPATHI (RK) and MISRA (RS). Effect of aflatoxin B₁ on chromatin-bound ribonucleic acid polymerase and nucleic acid and protein synthesis in germinating maize seeds. *Appl. Environ. Microbiol.* 42(3); 1981; 389-93
- 1325 DE VRIES (JW) and CHANG (HL). Comparison of rapid, high-pressure liquid chromatographic and CB methods for determination of aflatoxins in corn and peanuts. *J. Assoc. Off. Anal. Chem.* 65(2); 1982; 206-9
- The new, rapid HPLC method was compared with the current CB method (26.026) for 7 samples of corn, and 14 samples of peanut butter. The correlation between the methods was 0.991, and no significant difference could be observed, using Students' t-test at 15.7% α -risk. As the HPLC method requires much less time than the CB method, it has been adopted in the authors' laboratory. KMD

BARLEY

- 1326 GOERING (KJ), DEHAAS (BW), CHAPMAN (DW), ESLICK (RF) and GRAMERA (RE). New process for production of ultra high maltose syrup from special genetically derived barley. Starch. 32(10); 1980; 349-52

A process has been developed to produce high maltose syrup from waxy barley. Its low pasting temperature and ease of hydrolysis allow complete conversion without conventional cooking, and with the use of minimal amounts of malt. Since no cooking is involved, the protein is not denatured. Part of the recovered protein is denatured barley gluten with a protein content of 85-90%. Syrups produced in the laboratory and pilot plant runs have ranged between 3-7% glucose, 58-66% maltose, 16-20% maltotriose and 10-18% higher oligosaccharides. These values shift with different treatments. AA

PULSES

- 1327 FATMA (M) and KIES (C). Food practices, attitudes, and dietary adequacy of legume-consuming populations in Lahore, Pakistan. Nutr. Rep. Int. 23(3); 1981; 437-46

The in-depth survey by interview of legume consumers indicated that in comparison to recommended amino acid intake patterns, all groups showed satisfactory mean intake figures of all essential amino acids, except methionine. However, when total sulphur amino acid intake figures were considered, probably methionine-cystine requirements were marginal. Methionine supplementation of legumes was not found to be necessary. KAR

- 1328 SOSULSKI (FW), ELKOWICZ (K) and REICHERT (RD). Oligosaccharides in eleven legumes and their air-classified protein and starch fractions. J. Food Sci. 47(2); 1982; 498-502

Oligosaccharide compositions of flours from dehulled seeds of eleven legumes were determined by gas-liquid chromatography and mass spectroscopy. While soyabean contained 11.7% sugars, concentrations in lupine, cowpea, chickpea and lentil were about 8%; lima, navy and Northern beans, field pea, mung bean and fababean contained about % of sugars. Sucrose represented 20-55% of the total sugars; stachyose was the principal α -galactoside in most species. In addition, high amounts of manninotriose were found in chickpea and lentil flours whereas verbascose was a major component in field pea, mung bean and faba bean flours. The nine species and biotypes which contained starch were pin milled and air-classified into protein-rich and starch-rich fractions. The protein fractions were 40-90% higher than the flours in α -galactosides, especially raffinose, manninotriose, stachyose and verbascose. The starch fractions were depleted in α -galactosides, the concentrations varied from 1.2-2.8% of the fraction. AA

- 1329 GWIAZDA (S), SCHWENKE (KD) and RUTKOWSKI (A). Isolation and partial characterization of proteins from pea (*Pisum sativum* L.). Nahrung. 24(10); 1980; 939-50

Pea flour containing 25% protein (N x 6.25) was extracted with 10% NaCl, 89% of the nitrogenous material could be extracted, and 14% out of this consisted of albumins. After separation of albumins and globulins by dialysis, the latter were further separated into 11S and 7S fractions by preparative gel chromatography. Their sedimentation coefficients were 11.9S and 6.4S respectively. The isolated globulins showed relatively high glutamine, aspartic acid, and arginine contents, but lacked sulphur-containing amino acids. The essential amino acid indices calculated were as follows: pea flour 69; raw globulin fraction 62; 11 S and 7 S globulins 32; and albumins 78. Hence, methods employed for isolation of pea protein should be such that loss of albumins is avoided. KMD

CHICK PEA

- 1330 SINGH (U), KHERDEKAR (MS) and JAMBUNATHAN (R). Studies on desi and kabuli chick pea (*Cicer arietinum* L.) cultivars. The levels of amylase inhibitors, levels of oligosaccharides and *in vitro* starch digestibility. J. Food Sci. 47(2); 1982; 510-12

Amylase inhibitor activity (AIA) of chick pea extracts was investigated using pancreatic and salivary amylases. The extracts showed higher inhibitor activity towards pancreatic amylase than salivary amylase. Mean values indicated slightly higher inhibitory activity in desi than in kabuli cultivars, though clear-cut differences were not observed among the cultivars. While *in vitro* starch digestibility of meal samples indicated no large differences among desi and kabuli types of chick pea, the mean values of digestibility of isolated starches of kabuli types was higher than those of desi types. The mean values of stachyose were higher in desi cultivars. When desi and kabuli types were considered together, stachyose and raffinose contents were not found significantly related to the concentrations of total soluble sugars while stachyose showed a significant correlation with raffinose. AA

MUNG BEAN

- 1331 BHAT (KK), MAHADEVAIAH (B), ANANTHAKRISHNA (SM), MAHADEVAIAH (M), DHANRAJ (S), GOVINDARAJAN (VS), ANANDASWAMY (B), PRABHAKAR (JV) and SEN (DP). Studies on packaging and storage of fried mung (*Phaseolus aureus*) dhal. J. Food Sci. Technol. (India) 19(5); 1982; 197-203

Deep fat fried mung dhal (Indian snack item) with 1.8% moisture content was packed in flexible ((i) High density polyethylene (HDPE), (ii) MXXT + low density polyethylene (LDPE), (iii) Polyester/polyethylene (PE) and (iv) Paper/PE/Al.foil/LDPE)) containers and stored at 27 C and 65% RH and 38 C and 92% RH for 360 days. Samples were withdrawn at intervals and analysed for moisture, peroxide value (PV), free fatty acids and for acceptability. In rigid containers (tin-plain and under N and CO₂ and Al with and without PE liner cans) the product was stored for 360 days at 5, 27 and 38 C. In flexible containers at 38 C, fried mung dhal could be stored for 40, 60, 40 and 120 days. and at 27 C for 110 in (i), (ii) and (iii) and for 210 days in (iv). Samples stored at 38 C always showed higher PV than those stored at 27 C. In rigid containers, the storage life was 360 days and temperature and gas showed no significant effect on product quality; PV showed no correlation with deterioration in flavour or storability. KAR

- 1332 TAKAHASHI (S), KITAHARA (H) and KAINUMA (K). Properties and cooking quality of starches. Part I. Chemical and physical properties of starches from mung bean and sago. J. Jpn. Soc. Starch Sci. 28(3); 1981; 151-9

Mung bean starch noodle "Tomen" and starch noodle "Harusame" made from starch of potato and/or sweet potato are different in texture when they are cooked in boiling water. The most significant difference between them was high insolubility of "Tomen" in boiling water. Mung bean starch showed the following characteristic properties compared with other starches. The gelatinization temperature was relatively high. Viscosity, swelling power and solubility were the lowest among the starches studied. Amylose content of them was 34% for mung bean, 28% for corn, 26% for sago and 22% for potato. The results of X-ray diffraction studies showed A-pattern for mung bean and C-pattern for sago. Mung bean starch gel was the hardest and required the highest breaking force, from the results of a rheolometer, it showed the highest-syneresis from the gel during storage. Highly retrograding property of mung bean starch seems to affect strongly the desirable

texture and insolubility in hot water, which is considered to be an important and desirable cooking quality for the "Tomen" and "Harusame". In addition, the results of comparative studies of chemical and physical properties of starches of potato, corn, sago and mung bean are discussed. AA

- 1333 ANDREWS (WH), MISLIVEC (PB), WILSON (CR), BRUCE (VR), POELMA (PL), GIBSON (R), TRUCKSESS (MW) and YOUNG (K). Microbial hazards associated with bean sprouting.

J. Assoc. Off. Anal. Chem. 65(2); 1982; 241-8

The behaviour of microorganisms was studied in mung beans and alfalfa seeds before and after germination in modified, commercially available bean-sprouting kits. The microorganisms were enumerated by the aerobic plate count (APC) and by total yeast and mold count procedures. *Salmonella* species were artificially inoculated into selected samples and were enumerated by the most probable number (MPN) method. After germination of the beans or seeds into mature sprouts, significant increases were noted in APCs and in MPN values of *Salmonella* species. Although counts of yeasts and molds did not increase significantly after germination, these samples showed an increase in toxic *Aspergillus flavus* and potentially toxic *Alternaria* species. The presence of toxic *Penicillium cyclopium* molds also increased substantially in 5 samples of a single brand of mung beans. Analysis of selected sprout samples, however, showed no presence of aflatoxin. AA

WINGED BEAN

- 1334 SATHE (SK), DESHPANDE (SS) and SALUNKHE (DK). Functional properties of winged bean (*Psophocarpus tetragonolobus* (L.) DC) proteins.

J. Food Sci. 47(2); 1982; 503-9

A protein concentrate (71.45% protein on a dry weight basis) was prepared from winged bean (*Psophocarpus tetragonolobus* (L.) DC) seeds. Solubility of the protein concentrate was minimal at a pH of 4.0. Sodium dodecyl sulphate-polyacrylamide gel electrophoresis (SDS-PAGE) of the bean flour proteins and protein concentrate indicated 9 subunits each, with apparent molecular weight ranges of 27,000-380,000 and 14,200-143,000 daltons, respectively. Least gelation concentrations and water and oil absorption capacities of the seed flour and the protein concentrate were determined. Emulsion and foaming properties of the protein concentrate were investigated. Effect of moist heat on seed protein digestibility was assessed *in vitro*. Protein concentrate had lower tannins and trypsin, chymotrypsin, and α -amylase inhibitory activities compared to bean flour. AA

LUPIN

- 1335 SATHE (SK), DESHPANDE (SS) and SALUNKHE (DK). Functional properties of lupin seed (*Lupinus mutabilis*) proteins and protein concentrates.

J. Food Sci. 47(2); 1982; 491-7,502

OILSEEDS AND NUTS

- 1336 BEUSTER (K-H). Trends in the breeding of oilseeds on the basis of registrations in "Bundessortenamt".

Fette Seifen Anstrichm. 82(12); 1980; 476-8 (German)

GROUNDNUT

- 1337 PATTEE (HE), PEARSON (JL), YOUNG (CT) AND GIESBRECHT (FG). Changes in roasted peanut flavour and other quality factors with seed size and storage time.
J. Food Sci. 47(2); 1982; 455-6, 460
- 1338 SHIEH (YSC) and BEUCHAT (LR). Microbial changes in fermented peanut and soyabean pastes containing kojis prepared using *Aspergillus oryzae* and *Rhizopus oligosporus*.
J. Food Sci. 47(2); 1982; 518-22
- 1339 SHIEH (YSC), BEUCHAT (LR), WORTHINGTON (RE) and PHILLIPS (RD). Physical and chemical changes in fermented peanut and soyabean pastes containing kojis prepared using *Aspergillus oryzae* and *Rhizopus oligosporus*.
J. Food Sci. 47(2); 1982; 523-9

Peanut seed size and time of storage have been investigated as to their influence on roasted flavour, peanut butter colour, blanchability of roasted peanuts, oxidative stability and iodine value of raw peanuts. Seed size had a significant effect on roasted flavour and peanut butter colour with constant roasting time and with roasting to a uniform peanut butter colour. Blanchability of the seed after roasting was also significantly affected by seed size as well as storage time. Oxidative stability of the raw peanuts showed a general tendency to decrease with seed size and storage time. Iodine values were significantly higher in the smallest seed size but storage time did not affect iodine values. The data suggest that inferior quality is being introduced into marketing channels through use of a 5.95 mm screen size as a minimum for grading U.S. No.1 Virginia-type peanuts. AA

SOYABEAN

- 1340 SCHOLFIELD (CR). Composition of soyabean lecithin.
J. Am. Oil Chem. Soc. 58(10); 1981; 889-92
- Commercial soyabean lecithin is a complex mixture containing Ca 65-75% phospholipids together with triglycerides and smaller amounts of other substances. The major phospholipids include phosphatidylcholine, phosphatidylethanolamine and inositol-containing phosphatides. Other substances reported include carbohydrates, pigments, sterols and sterol glycosides. This paper reviews the nature of the compounds found in soyabean lecithin and our present knowledge of its composition. AA
- 1341 LIST (GR), AVELLANEDA (JM) and MOUNTS (TL). Effect of degumming conditions on removal and quality of soyabean lecithin.
J. Am. Oil Chem. Soc. 58(10); 1981; 892-8
- 1342 THOMPSON (DB) and ERDMAN (JW) Jr. Phytic acid determination in soyabeans.
J. Food Sci. 47(2); 1982; 513-7
- 1343 SOETRISNO (U), HOLMES (ZA) and MILLER (LT). Effect of heating time of soyabean on vitamin B₆ and folacin retention, trypsin inhibitor activity, and microstructure changes.
J. Food Sci. 47(2); 1982; 530-34, 537
- 1344 SATO (HH) and PARK (YK). Production of maltose from starch by simultaneous action of beta amylase and *Flavobacterium isoamylase*.
Starch. 32(10); 1980; 352-5
- Debranching isoamylase was prepared by fermentation of *Flavobacterium sp.* and purified. Soyabean β -amylase was extracted from defatted soyabean meal and purified, 1.6, 4.0, 6.6, and 9.1% DE liquefied corn starch was prepared by bacterial α -amylase. The mixture of liquefied

starch *Flavobacterium* isoamylase, and soyabean β -amylase was incubated at 40 C, pH 6.0, for 46 hours. The maximum yield of hydrolysates from 1.6 and 4.0% DE substrates was maltose and a considerable amount of maltotriose, but no detectable glucose. 6.6 and 9.1% DE substrates also produced largest amounts of maltose with moderate maltotriose, and small amounts of glucose were also formed during hydrolysis. With the increase of DE of the substrate, the yield of maltose decreased and the yield of glucose and maltotriose increased. AA

COTTONSEED

- 1345 WYATT (DM). Simultaneous analysis of BHA, TBHQ, BHT and propyl gallate by gas chromatography as extracted from refined vegetable oil. *J. Am. Oil Chem. Soc.* 58(10); 1981; 917-20
- 1346 GAD (TE) and EL-ZALAKI (EM). Effect of cooking cottonseed meals in the presence of Borax on the quality of meals and oils. *Fette Seifen Anstrichm.* 82(12); 1980; 478-81
- The results indicate that the borax concentration required to decrease the free gossypol content of the meal by 93% and to completely diminish the total gossypol content of the oil depended on the methods of cooking the meals. The crude oil obtained from the borax treated cooked meals was of very light colour and was easily bleached. The crude protein content of the meals was not affected by the borax concentration, but decreased upon cooking by using the paraffin oil bath. AA
- 1347 CHERRY (JP) and GRAY (MS). A review of lecithin chemistry and glandless cottonseed as a potential commercial source. *J. Am. Oil Chem. Soc.* 58(10); 1981; 903-13
- 1348 FISHER (GS) and SCHULLER (WH). Gas chromatographic analysis of cyclopropenoid acids in cottonseed oils. *J. Am. Oil Chem. Soc.* 58(10); 1981; 943-6

SUNFLOWER

- 1349 MORRISON (WH). Sunflower lecithin. *J. Am. Oil Chem. Soc.* 58(10); 1981; 902-3

SESAME

- 1350 BRITO (O) and NUNEZ (N). Evaluation of sesame flour as a complementary protein source for combinations with soy and corn flours. *J. Food Sci.* 47(2); 1982; 457-60
- Sesame products in combination with soy flour, were evaluated as a protein source. Proximate analyses, microbiological examination, determination of vitamins, minerals, selenium content, and nutritional evaluation were carried out. Monagas Aceitera variety flours are similar to other sesame proteins in composition but are higher in lysine and methionine. Enrichment with soy increased PER value for all sesame products. At commonly used fortification levels, sesame-soy blends may be as useful as soy alone for addition to corn-based foods. Some sesame flours and isolates might contain toxic amounts of selenium. AA

MUSTARD

- 1351 KUMAR (R) and ABIDI (AB). Varietal differences in chemical quality parameters of yellow Indian mustard (*Brassica juncea*)(L.) cfern and coss grown in Uttar Pradesh (India). *J. Am. Oil Chem. Soc.* 58(10); 1981; 947

CANOLA

- 1352 DAUN (JK), DAVIDSON (LD), BLAKE (JA) and YUEN (WO). Comparison of methods for the analysis of phosphorus in canola oils. J. Am. Oil Chem. Soc. 58(10); 1981; 914-6

CASHEW

- 1353 SRIDHARAN (B). Cashew in India's export trade. Indian J. Agric. Econ. 37(3); 1982; 317-22
The paper covers the vital role played by cashew industry in earning foreign exchange. The trend of India's export of cashewnuts and effort needed to increase domestic production and improve the export performance by finding new markets and identifying new sources for import of raw nuts have been reviewed. KMD
- 1354 SANDHU (HK). An econometric analysis of Indian export share of cashew kernels in the world trade. Indian J. Agric. Econ. 37(3); 1982; 300-305
The paper explains the importance of cashew as a foreign exchange earner for India and estimates the trend values through an econometric analysis. Exports of cashew to countries like, USSR and USA and the export market share of cashew kernel in the world have been analysed. KMD

TUBERS AND VEGETABLES

- 1355 SPLITTSTOESSER (DF) and WILKISON (M). Effect of a repair step on the recovery of coliforms from frozen blanched vegetables. J. Food Quality. 4(2); 1981; 107-11
The incubation of vegetable homogenates in water or trypticase soy broth for 1 hour at 30 C resulted in a 5 to 10-fold increase in the recovery of coliforms when subsequently cultured in lauryl sulphate tryptose broth or on violet red bile agar. AA
- 1356 DRAKE (SR), SPAYD (SE) and THOMPSON (JB). The influence of blanch and freezing methods on the quality of selected vegetables. J. Food Quality. 4(4); 1981; 271-8
Microwave blanched vegetables were lower in colour and ascorbic acid than water or steam blanched vegetables. Shear values for microwave blanched asparagus were higher than the values for water or steam blanched. Drip loss was higher for microwave blanched green beans and peas than water or steam blanched. The reverse was true for asparagus. Sensory preference scores for colour and flavour were very low for the microwave blanched vegetables. Little or no difference in quality was found between water and steam blanched vegetables. Individually, quick frozen vegetables displayed less drip loss than common blast frozen vegetables and shear values were lower. AA
- 1357 AUE RMANN (E), DASSLER (HG), JACOBI (J), CUMBROWSKI (J) and MECKEL (U). Studies on the heavy metal contents of cereals and potatoes. Nahrung. 24(10); 1980; 925-37 (German)
The heavy metal contents of cereals and potatoes from three territories with varying loads of heavy metal emissions (rural region, overcrowded urban region, region with nonferrous metal industry) were determined by means of atomic absorption spectrometry. The contents of heavy metals, except manganese, in cereals, were found to be higher than the normal values. In potatoes too, the heavy metal contents, except manganese, registered an increase. In cereals, the manganese levels were less by half (normal values 14-30 ppm) and in potatoes, they (7.2 ppm on a dry weight basis) were somewhat reduced. Finally, suggestions have been given for preventing or impeding the entrance of heavy metals into the biocycle. VR

- 1358 HUNT (TW), LEIDY (RB), SHEETS (TJ) and DUNCAN (HE). Residues of ethoprop in eight vegetables.
Bull. Environ. Contam. Toxicol. 27(1); 1981; 84-9

ONION

- 1359 WU (JL), CHOU (CC), CHEN (MH) and WU (CM). Volatile flavour compounds from shallots.
J. Food Sci. 47(2); 1982; 606-8

BEET

- 1360 LEE (YN), WILEY (RC), SHEU (MJ) and SCHLIMME (DV). Purification and concentration of betalaines by ultrafiltration and reverse osmosis.
J. Food Sci. 47(2); 1982; 465-71, 475

POTATO

- 1361 HARGETT (CA), NELSON (AI), WEINGARTNER(KE) and ERDMAN (JW) Jr. Development, utilization and protein quality of potato: soy: egg flakes.
J. Food Sci. 47(2); 1982; 461-4

- 1362 BEAULIEU (F) and HADZIYEV (D). Determination of BHA and BHT in dehydrated mashed potatoes.
J. Food Sci. 47(2); 1982; 589-92, 595

The extraction step in BHA (butylated hydroxyanisole) or BHT (butylated hydroxytoluene) analysis of potato granules, unless precautions are taken, leads to a recovery of only 10-50%. This study showed that BHA (BHT) is retained in granules by retrograded starch and, mostly, its amylose moiety. No satisfactory recovery was obtained using solvents of increasing dielectric constant unless the granules were first hydrated with water. A rapid antioxidant extraction procedure, based on the hydration principle and suitable for quality control labs, is described. Comparative data were acquired for the content of BHA (BHT) in potato granules analyzed by differential pulse voltammetry (using a glassy carbon electrode) and gas-liquid chromatography. AA

- 1363 MEINDERSMA (GW). Application of membrane filtration in the potato starch industry.
Starch. 32(10); 1980; 329-34

In the modern potato starch factory, apart from starch, protein and protamylase are extracted from the potato juice which is liberated in the course of the process. From the energy saving point of view, concentration of the potato juice is highly desirable. Depending on the process, hyperfiltration or ultrafiltration appear to be suitable for this purpose. AA

- 1364 PUTZ (B) and TEGGE (G). Effect of agricultural possibilities on some quality criteria of potato starch.
Starch. 32(10); 1980; 334-40 (German)

Investigations were made to find out whether the quality of potato starch can be influenced by different ways of cultivation. The results show that starch granule volume as well as viscosity are highly affected by year and location of cultivation. Furthermore, potato variety is of high importance. This influence, however, can be made up with year and location of cultivation. No effect of organic or mineral fertilizers could be found. Hence, there is no possibility of producing a desired starch quality in the plants. AA

- 1365 JETTEN (W), STAMHUIS (EJ) and JOOSTEN (GEH). Acetylation of potato starch to a low degree of substitution. *Starch*. 32(11); 1980; 364-8
- 1366 MITTELBAACH (F), BERGHOFER (E), STEYRER (W) and HEIN (W). Enzymatic hydrolysis of heat coagulated potato protein. II. Parameters determining the reaction. *Starch*. 32(11); 1980; 369-75 (German)
 Some test parameters of the enzymatic hydrolysis of heat coagulated potato protein were investigated. Reducing and eliminating, respectively, the influence of proteinlike inhibitors by selection of specific enzymes or by application of proper pretreatment methods was of major importance. AA
- 1367 MICA (B). Variations of content of pectinic substances in boiled potatoes. *Starch*. 32(11); 1980; 375-80 (German)
 The pectin content and their degree of esterification show considerable variations during the boiling of potatoes. The degree of esterification ranges between 8.21 and 13.13%. Pectin content is varied by calcium and magnesium. The storage period also influences the pectin content. The importance of different pectin contents with regard to the texture of potatoes is also revealed. KMD
- 1368 MURAKAMI (N), ASAMA (K), ITOH (H-I) and ITOH (T). Studies on starch in potato breeding. II. Variation in diameter of starch granule and inorganic constituents among various potato varieties and *Solanum* species. *J. Jpn. Soc. Starch Sci.* 28(3); 1981; 160-65 (Japanese)
 The characteristics of potato varieties for breeding lines varied from 13.7-40.9 μm diameter of starch granule, 100-439 mg of ash, 26-128 mg in P, 19.65 mg of K, 2.2-7.5 mg of Mg, and 0.2-2.4 mg/100g of Ca content. Similarly, the characteristics among *Solanum* species varied from 13.0-39.1 μm in diameter of starch granule, 73-494 mg of ash, 21-101 mg in P, and 6-68 mg/100g of K content. Several varieties or breeding lines showed less than 200 mg/100g ash and over 28.0 μm in diameter of starch granule. AA
- 1369 OGASAWARA (K). Microbiological quality of potato starches in Hokkaido. *J. Jpn. Soc. Starch Sci.* 28(3); 1981; 204-5 (Japanese)
- 1370 YAMAMOTO (K). Studies on rheological properties of potato starches in the practical application. *J. Jpn. Soc. Starch Sci.* 28(3); 1981; 206-14 (Japanese)
 One of the recommended methods for rice starch preparation by alkalis was proposed by the author. In order to elucidate the difference of pasting character between classified potato starches, some properties of the starches were investigated by using chemical and enzymatic methods. There are no differences in the molecular structure among the classified potato starches in terms of blue value, amylose content, beta-amyloly-sis limit distribution of chain length and some properties of Nageli amyloextrin. It was confirmed that small granule starch showed higher phosphorus content than large granule starch. In the case of same cation substitution, peak viscosity in amylogram showed high correlation with starch granular size. Changes in some rheological properties, such as flow curves and torque-time dependence, during pasting were observed. Changes in pasting properties of classified potato starches were studied by warm water treatment method. In Japan, about 250,000 tons of potato starches are produced. More than 85% of them are produced in 18 factories belonging to Agricultural Co-operation in Hokkaido Prefecture. AA

TAPIOCA

- 1371 REVUZ (B) and VOISIN (D). Protein enriched tapioca. Ind. Aliment. Agric. 97(10); 1980; 1079-84 (French)
The ADOUR SPEICHIM process for the transformation of a starchy raw material into a balanced food, rich in carbohydrates, proteins, and vitamins has been described. The proteins are those of the yeasts which ferment starch without prior hydrolysis. The final product can be used as fodder or food. KMD

TOMATO

- 1372 BISHOP (RH), DUNCAN (CL), EVANCHO (GM) and YOUNG (H). Estimation of fungal contamination in tomato products by a chemical assay for chitin. J. Food Sci. 47(2); 1982; 437-9, 444
A chemical method for the quantitative measurement of fungal chitin was used to estimate the level of mold contamination in tomato products. The alkaline degradation of chitin results in a polyglucosamine which is measured colorimetrically and the results expressed as μg of fungal glucosamine. Addition of fungal mycelium to tomato products gave recoveries of $97 \pm 3\%$ of the expected level of glucosamine. Analysis of various types of tomato products showed a significant correlation ($P < 0.01$) between fungal glucosamine content and the Howard mold count. AA

CUCUMBER

- 1373 LEE (JP), UEBERSAX (MA) and HERNER (RC). Effect of postharvest holding conditions on the quality of salt-stock pickles. J. Food Sci. 47(2); 1982; 449-54

OSTRICH FERN

- 1374 BUSHWAY (AA), WILSON (AM), McGANN (DF) and BUSHWAY (RJ). The nutrient composition of fresh fiddlehead greens. J. Food Sci. 47(2); 1982; 666-7

FRUITS

- 1375 HOF SOMMER (HJ) and BIELIG (HJ). The importance of selenium and its analytical coverage in fruit and vegetable products. Dtsch. Lebensmittel-Rundschau. 76(12); 1980; 419-26 (German)
The important role of selenium in nutrition is explained by the point of view of toxicological and essential aspects. The interactions with other mineral compounds are discussed. An analytical method for the determination of selenium in foodstuffs is presented, so that a routine measurement in fruit and vegetable products will be possible. A detection limit of $2 \mu\text{g/kg}$ can be obtained by addition of copper ions, to modify the matrix chemically. This addition is necessary for measuring in the graphite tube by flameless AAS. The digestion is conducted by burning the organic material in a pure oxygen atmosphere. Selenium contents of German fruits, vegetables and babyfood products are reported. AA
- 1376 BOURNE (MC). Effect of temperature on firmness of raw fruits and vegetables. J. Food Sci. 47(2); 1982; 440-4
The firmness of a number of fruits and vegetables was measured by deformation, extrusion and puncture tests over the temperature-range

0-45 C. Most commodities showed decreasing firmness with increasing temperature, but there were several exceptions to this general rule. For the majority of the commodities tested, the firmness temperature relationship was approximately linear. The firmness-temperature coefficient is defined as $((\text{firmness at } T_2 - \text{firmness at } T_1) / (\text{firmness at } T_1 (T_2 - T_1))) \times 100$ (percent change in firmness per degree temperature change) where T_1 = lowest temperature and T_2 = highest temperature at which firmness is measured. The firmness-temperature coefficient ranged from -1.65 for apricot to +0.12 for carrot using the puncture principle, from -0.97 for Baby Gold peach to +7.7 for large Canoga strawberries tested between 30-45 C using the deformation principle, and from -0.04 for Golden Delicious apple stored 7 months to -1.34 for NK 199 sweet corn using the extrusion principle. AA

STRAWBERRY

- 1377 VENTURE (JP) and CHEFTEL (JC). Study of parameters influencing the desulphitation of strawberry pulps.

Ind. Aliment. Agric. 97(12); 1980; 1317-24 (French)

Sulphur dioxide removal from strawberry pulp containing about 2 g SO₂ per kg has been studied on a laboratory scale. SO₂ removal is accelerated by a high boiling temperature, a high turbulence, sweeping of the evaporating surface with nitrogen, a pH below 3, and low total solids. Under optimal conditions, 94% of the initial SO₂ was removed in 20 minutes. Adapted to commercial practice, such an operation, carried out before addition of sugar and cooking, should allow reduction of SO₂ content of jams to less than 10 mg/kg. AA

DATE

- 1378 MAROUF (BA) and ZEKI (L). Isolation and characterization of invertase from Iraqi date fruit.

J. Food Sci. 47(2); 1982; 678-9

BLUEBERRIES

- 1379 SULLIVAN (JF), CRAIG (JC) Jr., DEKAZOS (ED), LEIBY (SM) and KONSTANCE (RP). Dehydrated blueberries by the continuous explosion-puffing process.

J. Food Sci. 47(2); 1982; 445-8

CRANBERRY

- 1380 MARWAN (AG) and NAGEL (CW). Separation and purification of hydroxycinnamic acid derivatives in cranberries.

J. Food Sci. 47(2); 1982; 585-8

BANANA

- 1381 JAYARAMAN (KS), RAMANUJA (MN), DHAKNE (YS) and VIJAYARAGHAVAN (PK). Enzymatic browning in some banana varieties as related to polyphenoloxidase activity and other endogenous factors.

J. Food Sci. Technol. (India) 19(5); 1982; 181-6

Polyphenoloxidase (PPO) activity and level, ascorbic acid, total phenolic content and pH were determined and compared in the ripe pulp of 5 major banana cultivars and correlated with the differences in their rate of enzymatic browning. Browning was influenced mainly by PPO activity and level, and the content of ascorbic acid which showed differences among the cultivars. Varieties relatively low in PPO activity and concentration and high in ascorbic acid exhibited the least

browning. The pH of the pulp has also exerted some influence on browning; when the pH was nearer to 7.0, it was more susceptible to browning. No significant differences were observed in the total phenolic content of the 5 varieties and this did not therefore, appear to be a factor limiting browning in bananas. Experiments also ruled out possible involvement of endogenous PPO inhibitors in low active varieties and activators in high active ones. PPO activity and concentrations were almost twice during winter months as compared to those during summer suggesting that seasonal variation could be utilised to advantage in selecting raw material with the least PPO activity to minimise browning during processing. AA

MANGO

- 1382 SAINI (SPS), MUDAHAR (GS), RANOTE (PS) and BHATIA (BS). Studies on preparation of beverage from sulphated mango pulp. J. Food Sci. Technol. (India) 19(5); 1982; 218-20

Pulp from *Totapuri*, *Dusehri*, *Chousa*, Lucknow local, *Langra*, *Desi* and *Fazli* varieties of mango was adjusted to 12% total soluble solids, heated and preserved with 700 ppm SO₂ in 2.5 l capacity bottles. Ready-to-serve beverages prepared to contain 15% pulp, 13° brix and 0.3% acidity was filled hot at 80 C into 200 ml bottles, cooled and stored at room temperature. The beverage which contained 64 ppm SO₂ was acceptable when tested by the panel of judges. The cost of preserved pulp ranged from Rs. 4 to 6/kg of pulp. KAR

PEACH

- 1383 GUINIVAN (RA), THOMPSON (NP) and BARDALAYE (PC). Simultaneous electron capture detection of chlorpyrifos and 3,5,6-trichloro-2-pyridinol residues in peach and Bhia grass field samples following gel permeation cleanup. J. Assoc. Off. Anal. Chem. 65(2); 1982; 210-14

- 1384 BRECHT (JK), KADER (AA), HEINTZ (CM) and NORONA (RC). Controlled atmosphere and ethylene effects on quality of California canning apricots and clingstone peaches. J. Food Sci. 47(2); 1982; 432-6

Storage at 2% O₂ plus 5% CO₂ at 1.1 C maintained higher flesh firmness and lower pH and retarded decay more effectively than air storage of immature (M1) and over-mature (M3) Patterson and Tilton apricot fruits. CA storage of fruits picked at the optimum maturity stage (M2) produced little benefit over air storage. Treatment with 100 ppm ethylene for 48 hours accelerated softening and colour change at 20 C compared to ripening in air and may potentially be used to prepare immature apricot fruits for canning in the shortest possible time. Large differences in storageability and canned quality following storage were found among the five clingstone peach cultivars tested. Loadel and Carolyn peaches, if in sound condition at harvest, can be stored for upto 4 weeks under 2% O₂ + 5% CO₂ at 1.1 C. Andross, Klamt and Halford peaches should be stored for shorter storage periods only. Fruits ripened at 20 C with ethylene (100 ppm for 48 hours) were similar to those ripened without it in appearance, texture, and flavour. AA

PLUM

- 1385 HENNING (W) and HERRMANN (K). Flavonol glycosides of plums of the species *Prunus domestica* L. and *Prunus salicina* Lindley. 12. Phenolics of fruits. Z. Lebensmittel-Unters. Forsch. 171(2); 1980; 111-8 (German)

APPL E

- 1386 ROSANOFF (A) and KENNEDY (BM). Bioavailability of iron produced by the corrosion of steel in apples.
J. Food Sci. 47(2); 1982; 609-13

The bioavailability of iron formed by the corrosion of low-carbon steel (99% Fe) in contact with Red Delicious apples was measured in a rat model using a depletion-repletion experiment. The percentage of ingested iron converted to hemoglobin iron (Conversion Efficiency) was 74, 57, and 56%, respectively, for daily doses of 110, 190, and 285 μg of this iron, (Conversion Efficiency for FeSO_4 was 46-50%). When compared with $\text{FeSO}_4 = 100$, the relative biological value of this iron was found to range from 93-153. Ingestion of one Red Delicious apple that has been exposed to eight large iron nails for 24 hours could provide 10-15 mg iron having good bioavailability. AA

- 1387 DHANARAJ (S), ANANTHAKRISHNA (SM) and GOVINDARAJAN (VS). Apple quality: Development of descriptive quality profile for objective sensory evaluation.
J. Food Qual. 4(2); 1981; 83-100

An objective procedure for a descriptive quality profile for the evaluation of sensory qualities of apples is described. Sensorily identifiable attributes of texture, juiciness, aroma and taste and descriptive words for identifiable stages for each attribute are chosen through panel participation. This gave adequate training to the panel for uniform understanding of the quality stages and the descriptors. A scale which emphasizes the optimum stage of quality is proposed in the place of usual unipolar scale. The profile procedure has been used to evaluate quality of cold stored apples in a study of the effect of maturity and transport. Instrumental measurements of texture, juice-volume by a modification of the texture profile method, brix and acidity have also been determined. The sensory and instrumental data have been found to show good agreement. AA

SUGAR, STARCH AND CONFECTIONERY

- 1388 HOLLENBACH (AM), PELEG (M) and RUFNER (R). Effect of four anticaking agents on the bulk characteristics of ground sugar.
J. Food Sci. 47(2); 1982; 538-44

- 1389 FUJIMOTO (S), SUGIMURA (K), NAKASHIMA (S), SUGANUMA (T) and NAGAHAMA (T). Studies on starches of wild plants in Japan (Part 1). Starches from Karasu-uri (*Trichosanthes cucumeroides*) Kikarasu-uri (*Trichosanthes kirilowii* var. *japonica*), Musashiabumi (*Arisaema ringens*) and Kuwazu-imo (*Alocasia macrorrhiza*).
J. Jpn. Soc. Starch. Sci. 28(3); 1981; 166-73 (Japanese)

Starch samples prepared from the tubers or tuberous roots of the wild plants growing commonly in Japan: Karasu-uri, *Trichosanthes cucumeroides* Maxim (Cucurbitaceae); Kikarasu-uri, *Trichosanthes kirilowii* Maxim, var. *japonica* Kitam. (Cucurbitaceae); Musashiabumi, *Arisaema ringens* Schott (Araceae); Kuwazu-imo, *Alocasia macrorrhiza* Schott (Araceae), gave yields of 12%, 13%, 5% and 4% of the fresh tissues, respectively. In Karasu-uri starch, phosphorus was found in large amounts, and both the values of swelling power and viscosity on amylogram were very high. Starch of Kikarasu-uri was easily isolated and purified, and its property resembled that of potato starch. On the other hand, Musashiabumi starch was very closely related to sweet potato starch in all values. Kuwazu-imo starch was 1-2 μm in size and had low amylose content; it was gelatinized at lower temperature. AA

- 1390 FUJIMOTO (S), NAKASHIMA (S), KUBO (Y), SUGANUMA (T) and NAGAHAMA (T). Studies on starches of wild plants in Japan (Part 2). Starches from Karamushi (*Boehmeria nipononivea*), Oshiroi-bana (*Mirabilis jalapa*), Teppo-yuri (*Lilium longiflorum*) and Sarutori-ibara (*Smilax china*). J. Jpn. Soc. Starch Sci. 28(3); 1981; 174-9 (Japanese)

Starch samples prepared from the tuberous root of Karamushi, *Boehmeria nipononivea* Koidz. (Urticaceae); seed of Oshiroi-bana, *Mirabilis jalapa* Linn. (Nyctaginaceae); bulb of Teppo-yuri, *Lilium longiflorum* Thunb. (Liliaceae); and rhizome of Sarutori-ibara, *Smilax china* Linn. (Liliaceae), gave yields of 7%, 32%, 11% and 6% of the fresh tissues, respectively. Starch granules from Karamushi showed high values of phosphorus and amylose contents, and seemed to be of very hard structure. The endosperm of Oshiroi-bana's seed looked powdery, and composed of almost pure starch. Its starch granules were very fine, 1 μ in size, and showed low viscosity on amylogram in 6% paste. Starch of Teppo-yuri was large in size, resembling potato starch but was very stable in viscosity under high temperature. Sarutori-ibara starch was low in values whiteness and viscosity. AA

- 1391 FUJIMOTO (S), NAKASHIMA (S), KUBO (Y), SUGANUMA (T) and NAGAHAMA (T). Studies on starches of wild plants in Japan (Part 3). Starches from Ara-kashi (*Quercus glauca*), Suda-jii (*Castanopsis cuspidata* var. *sieboldii*), Sotetsu (*Cycas revoluta*), Ichu (*Ginkgo biloba*), Sharin-bai (*Rhaphiolepis unbellata*) and Biwa (*Eriobotrya japonica*). J. Jpn. Soc. Starch. Sci. 28(3); 1981; 180-87 (Japanese)

Starch samples prepared from the seeds of the six kinds of common trees in Japan: Ara-kashi, *Quercus glauca* Thunb. (Fagaceae); Suda-jii, *Castanopsis cuspidata* Schottky var. *sieboldii* Nakai (Fagaceae); Sotetsu, *Cycas revoluta* Thunb. (Cycadaceae); Ichu, *Ginkgo biloba* Linn. (Ginkgoaceae); Sharin-bai *Rhaphiolepis unbellata* Makino (Rosaceae); Biwa. *Eriobotrya japonica* Lindl. (Rosaceae), gave yields of 34%, 32%, 23%, 31%, 38% and 24% starch respectively. These starches were examined on granular size and shape, X-ray diffraction, iodine colouration, swelling power, solubility, amylography, digestibility of raw starches by glucoamylase, etc. and the characteristic features of them were described. It was observed among the starches examined that the characteristic properties of the starch became closer among the plants located in close taxonomical relation. Regarding the values of digestibility, swelling power, solubility and amylogram, the starches of Ara-kashi and Suda-jii seemed to be of the tuberous starch type, Sharin-bai and Biwa seemed to be of the cereal starch type and Sotetsu and Ichu intermediate between these two types. Among these starches only Ichu starch had "single-granules", and Biwa starch showed especially low viscosity on amylogram. AA

- 1392 FUJIMOTO (S), NAKASHIMA (S), KUBO (Y), SUGANUMA (T) and NAGAHAMA (T). Studies on starches of wild plants in Japan (Part 4). Starches from Ho-shida (*Thelypteris acuminata*), Hana-myoga (*Alpinia japonica*), Shoki-zuisen (*Lycoris aurea*) and Himehioogi-zuisen (*Tritonia crocosmiflora*). J. Jpn. Soc. Starch Sci. 28(3); 1981; 188-93 (Japanese)

Starch samples prepared from the rhizome of Ho-shida, *Thelypteris acuminata* Morto (Aspidiaceae) and Hana-myoga, *Alpinia japonica* Miq. (Zingiberaceae); bulk of Shoki-zuisen, *Lycoris aurea* Herb. (Amaryllidaceae); and corm of Himehioogi-zuisen, *Tritonia crocosmiflora* Nichols. (Iridaceae), gave yields of 10%, 7%, 13% and 9% of the fresh tissues, respectively. There had not been reported on these starches. Ho-shida starch was found to be so unusual that the granules are in flat disks and the polarization cross of them looks disappearing nearby the center of the granules. In addition, Ho-shida starch contained high amounts of amylose and phosphorus, hardly dissolved in hot water, and did not show any viscosity on amylogram in 6% paste. Hana-myoga starch belonged to "compound granule" with various shapes. The amylogram indicated higher gelatinization temperature and stable viscosity on heating and cooling. Shoki-zuisen starch was large in size, and its pasting characteristics was similar to that of sweet potato starch. AA

- 1393 NIKUNI (Z). Starch granule: This mysterious substance.
J. Jpn. Soc. Starch. Sci. 28(3); 1981; 194-203 (Japanese)
- 1394 WAKO (K). Studies on the maltooligosaccharide-producing amylases.
J. Jpn. Soc. Starch. Sci. 28(3); 1981; 215-8 (Japanese)
- 1395 CEH (M), DOLECEK (V), STROPNIK (C) and LESKOVAR (S). Characterization of electrodialysed starch fractions after thermal dispersion.
Starch. 32(10); 1980; 345-8 (German)
Six native starches were thermally dispersed in an autoclave at 120 C for 1 hour and 3 hour respectively and were separated by electrodialysis into sol (amylase) and gel (amylopectin) phases. The average molecular weights and the alkali numbers in these two starch constituents were determined. The results indicate that a thermal decomposition of starch molecules occurs at 120 C during prolonged dispersion in water which was accompanied by decrease in pH values. A theoretical linear correlation, exists between the molecular weights and the reciprocal values of alkali numbers. KMD
- 1396 MICHEL (JP), RAFFI (J), SAINT-LEBE (L), HUCHETTE (M) and FLECHE (G). Experimental study of the depolymerization of starch under the combined action of protons and gamma radiation.
Starch. 32(10); 1980; 340-4
- 1397 ALTWELL (WA), MILLIKEN (GA) and HOSENEY (RC). A note on determining amylopectin A to B chain ratios.
Starch. 32(11); 1980; 362-4
- 1398 TEGGE (G) and RICHTER (GG). Studies on the filtration of starch raw hydrolysates.
Starch. 32(11); 1980; 381-5 (German)
- 1399 SZEJTLI (J) and BOLLA (E). Stabilization of fat soluble vitamins with β -cyclodextrin.
Starch. 32(11); 1980; 386-91 (German)
Stability and dispersibility of the most important fat soluble vitamins D₃, K₃, A and E can be improved by complexing with cyclodextrin. Two molecules of β -cyclodextrin form a molecular 'capsule' for one molecule cholecalciferol. The complexation enhances the solubility in water, the stability against heat, light, oxygen, cations as well as biological activity of D₃ vitamin. K₃-vitamin forms a 1:1 complex with β -cyclodextrin in aqueous solution, however the isolated crystalline product contains 3 mol β -cyclodextrin for one mol menadione. The complexed menadione is not sublimable and retains its biological activity. AA
- 1400 MITCHELL (GA), VANDERBIST (MJ) and MEERT (FF). Gas-liquid chromatographic determination of adipate content of acetylated di-starch adipate.
J. Assoc. Off. Anal. Chem. 65(2); 1982; 238-40

BAKERY PRODUCTS

- 1401 SIRIVICHA (S) and KRAMER (A). A comparison of the farinograph and a modified shear-press for measuring the rheological properties of dough and its finished products.
J. Food Quality. 4(2); 1981; 121-36
The shear-press was found to be equal to the farinograph in providing information on certain rheological properties of dough, and high correlations were obtained between these 'texturegrams' and farinogram parameters. If the method of water absorption and mixing of flour could be standardised, the shear-press could be utilized both for predicting rheological properties of bakery products from determinations on doughs as well as direct evaluations of the finished products. KAR

- 1402 SPICHER (G), SCHRODER (R) and STEPHAN (H). The microflora of sour dough. X. The baking performance of the lactic acid bacteria occurring in starter cultures.
Z. Lebensmittel-Unters. Forsch. 171(2); 1980; 119-24 (German)
- 1403 DIBBLE (WE). Continuous mixing (Conference paper).
Baker's Dig. 55(4); 1981; 12-3,22
The developments taking place since 1955 in continuous mixing; sponge preparation; dough preparation and computerized control system are the aspects dealt. KAR
- 1404 McFAUL (R). Quality water for the baking industry.
Baker's Dig. 55(4); 1981; 16-7,22
Water softening methods, purification of water through reverse osmosis and deionization, are covered. KAR

BREAD

- 1405 ANON. International Bread Symposium, Zurich, 6-8 Oct. 1980.
Gordian. 80(12); 1980; 311
The author has summarized 10 papers which emphasize the dietary value of bread, and reflect the current position of bread consumption in Europe. KMD
- 1406 SLUIMER (P). Principles of dough retarding.
Baker's Dig. 55(4); 1981; 6-8,10
Article covers bread making process, fermentation, crumb structure; solubility of carbon dioxide and nitrogen, diffusion; mixing under carbon dioxide. KAR
- 1407 ZEMEL (MB) and SHELEF (LA). Phytic acid hydrolysis and soluble zinc and iron in whole wheat bread as affected by calcium containing additives
J. Food Sci. 47(2); 1982; 535-7
The effects of nonfat dry milk, CaCO_3 , CaCl_2 and MgCl_2 on phytate hydrolysis and on Zn and Fe availability was evaluated in whole wheat bread and in a model fermentation system. CaCO_3 and CaCl_2 both depressed phytate hydrolysis to an equivalent degree, but the milk had a greater effect than could be accounted for by its Ca content. MgCl_2 had a less pronounced effect than the Ca salts in both the bread and the model system. Increasing fermentation time in the model system increased phytate hydrolysis, but the effect was delayed when milk or CaCl_2 was added. Supplementing the bread dough with Ca equivalent to that typically contributed by Ca-containing additives caused 50% reductions in the available quantities of soluble ("free") zinc and iron; the decreases observed with varying added amounts of Ca or milk exhibited a high degree of correlation with the observed increases in residual phytate P. AA
- 1408 GARTI (N), ASERIN (A) and LINDNER (C). Evaluation of polyglycerol fatty acid esters in the baking of bread.
Baker's Dig. 55(4); 1981; 19-20,24
The study shows clearly that polyglycerol esters have the potential to be used in bread and, to some extent they can even replace SSL or other well established dough improvers. KAR
- 1409 WYATT (CJ) and RONAN (K). Evaluation of potassium chloride as a salt substitute in bread.
J. Food Sci. 47(2); 1982; 672-3
- 1410 FARIDI (HA), RANHOTRA (GS), FINNEY (PL) and RUBENTHALER (GL). Protein quality characteristics of Iranian flat breads.
J. Food Sci. 47(2); 1982; 676-7,679

- 1411 LORENZ (K) and DILSAVER (W). Bread compressibility as affected by slice thickness.
J. Food Sci. 47(2); 1982; 689,691
- 1412 TSEN (CC), BATES (LS), WALL (LL) Sr. and GEHRKE (CW). Effect of baking on amino acids in pizza crust.
J. Food Sci. 47(2); 1982; 674-5

COOKIE

- 1413 TSEN (CC), EYESTONE (W) and WEBER (JL). Evaluation of the quality of cookies supplemented with distillers' dried grain flour.
J. Food Sci. 47(2); 1982; 684-5
- 1414 SIRIVICHA (S), KAMEL (B) and KRAMER (A). The effect of protein fortification on the acceptability and rheological properties of cookie dough and its final product.
J. Food Quality. 4(2); 1980; 137-54
- All purpose wheat flour was fortified with 6% soy flour; and 2,4 and 6% single cell protein (SCP). Fortification with SCP at all levels altered all the sensory parameters significantly, but fortification with soy flour altered only cookie texture. Fortification with both SCP and soy flour significantly decreased the 'spread factor' quality.

PASTA

- 1415 WOODCOCK (EA), WARTHESEN (JJ) and LABUZA (TP). Riboflavin photochemical degradation in pasta measured by high performance liquid chromatography.
J. Food Sci. 47(2); 1982; 545-9,555

MILK AND DAIRY PRODUCTS

- 1416 ABRIL (JR), STULL (JW), TAYLOR (RR), ANGUS (RC) and DANIEL (TC). Characteristics of frozen desserts sweetened with xylitol and fructose.
J. Food Sci. 47(2); 1982; 472-5
- 1417 NICHOLS (DJ) and CHERYAN (M). Dairy and vegetable protein blends by co-extraction and co-ultrafiltration.
J. Food Sci. 47(2); 1982; 486-90
- 1418 ACTON (JC), BREYER (L) and SATTERLEE (LD). Effect of dietary fiber constituents on the *in vitro* digestibility of casein.
J. Food Sci. 47(2); 1982; 556-60
- 1419 HANSEN (AP) and SWARTZEL (KR). Taste panel testing of UHT fluid dairy products.
J. Food Quality. 4(3); 1981; 203-16
- Fluid dairy products processed by ultra-high-temperature steam injection were evaluated by two independent panels to determine the effect of % fat and process and storage conditions of flavour. Fat content from 0.5 to 10.5%, process time from 3.4 to 20.3 seconds, process temperature from 138 to 149 C, storage time from zero to 48 weeks, and storage temperature from 4 to 40 C were studied. The two panels consisted of an untrained consumer panel and a trained panel of dairy judges. Scores from both panels correlated well. Scores on all samples stored at 4 C generally increased through time while those at 40 C had declining scores. Samples with 3.25% fat generally scored higher than those with 0.5 or 10.5% fat. An empirical relationship and nomograph were formulated between dairy judge score, % fat, storage temperature and

storage time. Milk produced and stored at or near room temperature may be predicted to receive moderate scores through one year. AA

- 1420 LANG (F). Dairy desserts.
Milk Ind. 83(5); 1981; 25-7
Reviews the worldwide developments in dairy desserts as reflected in available literature supplemented by information from other sources.
KAR

MILK

- 1421 HILL (AW), HIBBITT (KG) and DAVIES (J). Particles in bulk milk capable of causing falsely high electronic cell counts.
J. Dairy Res. 49(2); 1982; 171-7
- 1422 ORMROD (IHL), HOLT (C) and THOMAS (PC). The inorganic constituents of milk. IV. Diffusible calcium and magnesium concentrations in goats' milk and the effect of starvation.
J. Dairy Res. 49(2); 1982; 179-86
- 1423 SHALABI (SI) and FOX (PF). Heat stability of milk: Synergic action of urea and carbonyl compounds.
J. Dairy Res. 49(2); 1982; 197-207
- 1424 CLIFFE (AJ) and LAW (BA). A new method for the detection of microbial proteolytic enzymes in milk.
J. Dairy Res. 49(2); 1982; 209-19
- 1425 COLLIN (J-C), MUSET DE RETTA (G) and MARTIN (P). Immunological identification of milk-clotting enzymes.
J. Dairy Res. 49(2); 1982; 221-30
- 1426 ANDERSON (M). Stability of lipoprotein lipase activity in bovine milk.
J. Dairy Res. 49(2); 1982; 231-7
- 1427 ALLEN (JC) and WRIEDEN (WL). Influence of milk proteins on lipid oxidation in aqueous emulsion. I. Casein, whey protein and α -lactalbumin.
J. Dairy Res. 49(2); 1982; 239-48
- 1428 ALLEN (JC) and WRIEDEN (WL). Influence of milk proteins on lipid oxidation in aqueous emulsion. II. Lactoperoxidase, lactoferrin, superoxide dismutase and xanthine oxidase.
J. Dairy Res. 49(2); 1982; 249-63
- 1429 GIL (A) and SANCHEZ-MEDINA (F). Effects of thermal industrial processing on acid-soluble nucleotides of milk.
J. Dairy Res. 49(2); 1982; 295-300
- 1430 GIL (A) and SANCHEZ-MEDINA (F). Acid-soluble nucleotides of human milk at different stages of lactation.
J. Dairy Res. 49(2); 1982; 301-7
- 1431 PHIPPS (LW). Homogenizing valve design and its influence on milk fat globule dispersion. I. Low rate of flow (100 l h^{-1} , $Re \leq 3000$).
J. Dairy Res. 49(2); 1982; 309-15
- 1432 PHIPPS (LW). Homogenizing valve design and its influence on milk fat globule dispersion. II. High rate of flow (1000 l h^{-1} , $6000 < Re < 15000$).
J. Dairy Res. 49(2); 1982; 317-22
- 1433 HANSEN (K), MIKKELSEN (T) and MOLLER-MADSEN (A). Use of the limulus test to determine the hygienic status of milk products as characterized by levels of gram-negative bacterial lipopolysaccharide present.
J. Dairy Res. 49(2); 1982; 323-8

- 1434 STUCKY (JE) and FORD (GD). Development of coagulum firmness in renneted milk: A two-phase process.
J. Dairy Res. 49(2); 1982; 343-6
- 1435 COW (LW), BACH (JW) and FLEEKER (JR). Steam distillation and gas-liquid chromatographic determination of triallate and diallate in milk and plant tissue.
J. Assoc. Off. Anal. Chem. 65(2); 1982; 215-7
- 1436 MILLS (OE) and THOMAS (TD). Nitrogen sources for growth of lactic Streptococci in milk.
NZ. J. Dairy Sci. Technol. 16(1); 1981; 43-55
The source of nitrogen for cell growth in milk appears to depend on the cell density of the culture. At low cell densities free amino acids and peptides are used, but as the cell density increases, cells appear to be dependent for growth on their proteinase to supply peptides from milk proteins. KAR
- 1437 EL-GENDY (SM) and MARTH (EH). Growth and aflatoxin production by *Aspergillus parasiticus* in the presence of *Lactobacillus casei*.
J. Food Prot. 44(3); 1981; 211-14
- 1438 MARSHALL (RJ). An improved method for measurement of the syneresis of curd formed by rennet action on milk.
J. Dairy Res. 49(2); 1982; 329-36
- 1439 SINHA (RN), SHUKLA (AK), MADAN LAL and RANGANATHAN (B). Rehydration of freeze-dried cultures of lactic streptococci.
J. Food Sci. 47(2); 1982; 668-9
- 1440 BLOORE (CG). A viscometer for milk concentrate.
NZ. J. Dairy Sci. Technol. 16(2); 1981; 191-3
A schematic diagram of the 'capillary' viscometer along with the conditions under which it will be working are presented. KAR
- 1441 KELLY (PM). The effect of preheat temperature and urea addition on the seasonal variation in the heat stability of skim-milk powder.
J. Dairy Res. 49(2); 1982; 187-96
- 1442 SUKAN (G) and ANDREWS (AT). Application of the plastein reaction to caseins and to skim-milk powder. I. Protein hydrolysis and plastein formation.
J. Dairy Res. 49(2); 1982; 265-78
- 1443 SUKAN (G) and ANDREWS (AT). Application of the plastein reaction to caseins and to skim-milk powder. II. Chemical and physical properties of the plasteins and the mechanism of plastein formation.
J. Dairy Res. 49(2); 1982; 279-93

BUTTER

- 1444 GALPIN (DB) and PARKIN (MF). Estimating the yield of butter by the measurement of losses.
NZ J. Dairy Sci. Technol. 16(3); 1981; 231-41
The losses of butter averaged 1.72% of the potential product in a plant. The losses were caused by the failure to attain the moisture specification (30% of the losses), losses to the effluent and vacreator tail waters (33%) excess milk fat in the butter milk (22%) and excess butter in the cartons (15%). KAR

WHEY

- 1445 MOHLER (MR), HUGUNIN (AG) and EBERS (K). Whey-based nonfat milk replacers in light chocolate-flavoured compound coatings. Food Technol. 35(6); 1981; 79-81

The results given here show that a light chocolate flavoured compound coating with consumer acceptance equal to that of non-fat dry milk can be formulated with milk derived ingredients. There appears to be a definite place in compound coatings for whey blends and especially for reduced minerals whey. KAR

- 1446 DUNKERLEY (JA) and ZADOW (JG). Rheological studies on heat-induced coagula from whey protein concentrates. NZ. J. Dairy Sci. Technol. 16(3); 1981; 243-52

Using an Instron testing machine fitted with different probe types, studies were made on the determination of the firmness of coagula. Further over a pH range of 2 to 8, the firmness of heat induced coagula from a range of cheddar cheese and HCl casein whey protein concentrates (WPC) were compared with those of egg white. KAR

CHEESE

- 1447 SANTOS (EC dos), GENIGEORGIS (C) and FARVER (TB). Prevalence of *Staphylococcus aureus* in raw and pasteurized milk used for commercial manufacturing of Brazilian Minas cheese. J. Food Prot. 44(3); 1981; 172-6

- 1448 SANTOS (EC dos) and GENIGEORGIS (C). Survival and growth of *Staphylococcus aureus* in commercially manufactured Brazilian Minas cheese. J. Food Prot. 44(3); 1981; 177-84

- 1449 SANTOS (EC dos) and GENIGEORGIS (C). Potential for presence and growth of *Staphylococcus aureus* in Brazilian Minas cheese whey. J. Food Prot. 44(3); 1981; 185-8

- 1450 IBRAHIM (GF), RADFORD (DR), BALDOCK (AK) and IRELAND (LB). Inhibition of growth of *Staphylococcus aureus* and enterotoxin. A production in cheddar cheese produced with induced starter failure. J. Food Prot. 44(3); 1981; 189-93,200

- 1451 CREAMER (LK) and OLSON (NF). Rheological evaluation of maturing cheddar cheese. J. Food Sci. 47(2); 1982; 631-6,646

A number of Cheddar cheese samples of different age, pH and moisture content have been examined rheologically and electrophoretically to determine whether the progressive changes in cheese texture were related to casein proteolysis. The force-compression curves obtained by crushing cubes of cheese between small flat plates at constant speed were different for the different cheese samples and were affected by the moisture content, pH and extent of α_{S1} -casein proteolysis that had taken place in the cheese. These results support a model of cheese microstructure in which an extensive network involving α_{S1} -casein molecules traverses the cheese and as the cheese ripens, chymosin cleavage of α -casein weakens the protein network. Such a model explains the rapid decrease in Cheddar cheese yield-force that occurs during the early stages of ripening. AA

- 1452 WU (MH) and FUNG (DYC). Prediction and characterization of normal and vat-failed cottage cheese. J. Food Sci. 47(2); 1982; 418-22

An acidification-heat-coagulation test has been developed for predicting cottage cheese vat-failure potential of milk. Milk is first acidified to pH 5.06 at 10 C and then heated at a slow rate (1 C increment per minute). Poor quality acidified milk ($> 10^4$ CFU/ml) forms

small curds at 37 C and below. Good quality acidified milk ($< 10^4$ CFU/ml) will form small curds at higher temperatures. By this procedure cottage cheese vat-failure potential of milk containing different levels of psychrotrophs can be predicted. Normal and vat-failed cottage cheese curds are characterized by % of grit in cottage cheese and amount of curd fines in whey. AA

- 1453 HICKS (CL), O'LEARY (J), AYLWARD (EB) and LANGLOIS (BE). Variation of laboratory cheese making procedures.
J. Food Prot. 44(3); 1981; 209-10
- 1454 GILLES (J) and FREESE (OJ). Moisture control in skim milk cheese.
NZ. J. Dairy Sci. Technol. 16(1); 1981; 89-90
High calcium losses during manufacture contribute to the difficulty of reducing moisture in skim milk cheese to the desired level. When a high starter percentage is being used, therefore, a reduction in the time in the whey should be made so as to retain calcium and promote moisture loss in the latter stages of the process. KAR
- 1455 ABDELBAKY (AA), NESHEWY (AE), RABIE (AHM) and FARAHAT (SM). Ripening changes in cephalotyre 'Ras' cheese slurries.
J. Dairy Res. 49(2); 1982; 337-41
- 1456 GILLES (J) and LAWRENCE (RC). The manufacture of cheese and other fermented products from recombined milk.
NZ. J. Dairy Sci. Technol. 16(1); 1981; 1-12
The aspects covered in this review under cheese include: the materials used for cheese making; preparation of the recombined milk; manufacture of cheddar type cheeses and miscellaneous cheese varieties. The fermented products covered are yoghurt from whole, and skim milk powder and production of 'Labneh' obtained from the secondary treatment of yoghurt. KAR
- 1457 WERNER (H) and JENSEN (F). Determination of low levels of sorbic acid in cheese (Hillerod method).
Dtsch. Lebensmittel-Rundschau. 76(12); 1980; 431-3
Sorbic acid is isolated from an acid sample slurry by steam distillation. The content of sorbic acid is determined in the distillate (for very low levels in an extract of the distillate) by spectrophotometry at 250-270 nm. The collaborative study showed that this method gave a fairly good recovery of sorbic acid added to cheese at 2-50 mg/kg levels, with relatively small variations between laboratories, and without pronounced systematic errors. VR
- 1458 MAHONEY (RR), LAZARIDIS (HN) and ROSENAU (JR). Protein size and meltability in enzyme-treated, direct acidified cheese products.
J. Food Sci. 47(2); 1982; 670-71
- 1459 WESTHOFF (D). Storage study of commercially pasteurized whole milk.
J. Food Quality. 4(3); 1982; 157-64
Pasteurized whole milk was obtained from retail outlets and from all the processing plants in Maryland. During storage at 7.0 C the milk was evaluated by a consumer-type panel and analyzed for microbial quality. Over 90% of the milk obtained from the processing plants was judged acceptable by the panel following seven days of storage at 7.0 C while 78% of the milk obtained at the retail level was judged as acceptable under the same conditions. Approximately 65% of all the milk surveyed at the retail level was less than two days old. Variations in the quality of milk among dairy processors and among retail outlets were noted. Total microbial numbers did not correlate well with organoleptic data. AA
- 1460 GUY (EJ). Stabilization of frozen goat milk concentrates by enzymatic lactose hydrolysis.
J. Food Sci. 47(2); 1982; 423-8

MEAT AND POULTRY

- 1461 MEYER (E). A plant for disinfection of waste water with Wofasteril in a playing house.
Fleisch. 33(11); 1979; 205-6 (German)
The results showed that a good disinfection effect is reached with 1% Wofasteril (active ingredient: per acetic acid) in the exposure time of 15 minutes. A special plant must be available for this process of waste water disinfection. The disinfectant must be dosed exactly, and the working specifications are to be adhered to. KMD
- 1462 GASTMANN (C) and BECHER (K). Results of slaughtering and cutting up of fattened calves.
Fleisch. 33(11); 1979; 207-8 (German)
- 1463 ROCKERT (E), SIEBERS (R) and DRESCHER (J). Ceritol special 9025 in the food industry.
Fleisch. 33(11); 1979; 219
- 1464 ARNDT (G) and RAEUBER (HJ). Ascertainment of the dielectric coefficients of meat.
Fleisch. 33(11); 1979; 216-8 (German)
The dielectric heating of meat is determined conclusively, not only from the technical data of the plant but also from the physical properties of the heated material. Dielectric constant and loss factor besides chemical composition and structure of the concerned material are strongly dependent on the frequency of the acting electrical field and the temperature. It is possible with the help of a device, which measures impedance, to determine DK value and loss factor of meat rather accurately. It can be represented as a function of frequency of a heating plant and the temperature change. KMD
- 1465 SUSS (P). About the design of the packages of canned meat and sausages (Part I.)
Fleisch. 33(11); 1979; 203-4 (German)
- 1466 GRAY (JI), MacDONALD (B), PEARSON (AM) and MORTON (ID). Role of nitrite in cured meat flavour: A review.
J. Food Prot. 44(4); 1981; 302-12
Little is known about the mechanism of the reactions leading to formation of cured meat flavour or of the identity of volatile and non-volatile substances responsible for it. This review of the contribution of nitrite to cured meat flavour in products such as ham, bacon and frankfurters includes sensory analyses and studies of the chemical components contributing to cured meat flavour. The antioxidant properties of nitrite in retarding development of warmed over flavour in cured meats are also discussed. AA
- 1467 BIELECKA (M), BALDOCK (JD) and KOTULA (AW). Determination of antibiotics in meat using *Bacillus stearothermophilus* spores.
J. Food Prot. 44(3); 1981; 194-200
- 1468 BREKKE (CJ) and EISELE (TA). The role of modified proteins in the processing of muscle foods.
Food Technol. 35(5); 1981; 231-4
Covers aspects on benefits of modification, modification techniques, chemical modification, enzymatic modification and chemical enzymatic modification. KAR
- 1469 ALLEN (CE) and FOEGEDING (EA). Some lipid characteristics and interactions in muscle foods. A review.
Food Technol. 35(5); 1981; 253-7
Aspects covered include lipids in muscle structure, lipid interactions and effects of cooking on lipid system. AA

- 1470 SCHMIDT (GR), MAWSON (RF) and SIEGEL (DG). Functionality of a protein matrix in comminuted meat products. Food Technol. 35(5); 1981; 235-7,
- 1471 RIZVI (SSH). Rheological properties of comminuted meat systems. Food Technol. 35(5); 1981; 238-43
This article reviews a few applicable engineering principles and presents an overview of recent developments that have taken place in the study of comminuted meat rheology. KAR
- 1472 LIVINGSTON (DJ) and BROWN (WD). The chemistry of myoglobin and its reactions. Food Technol. 35(5); 1981; 244-52
Article covers myoglobin and hemoglobin concentration *in situ*, the properties of the iron center in myoglobin, the common myoglobin derivatives, interconversion of myoglobin derivatives, and comparative biochemistry of myoglobins and interaction of myoglobin with other components of meat. KAR
- 1473 MOTT (EL), MacNEIL (JH), MAST (MG) and LEACH (RM). Protein efficiency ratio and amounts of selected nutrients in mechanically deboned spent layer meat. J. Food Sci. 47(2); 1982; 655-6,663
- 1474 KAMAREI (AR) and KAREL (M). An improved method for preparation of nitric oxide myoglobin. J. Food Sci. 47(2); 1982; 682-3
- 1475 HOSTETLER (RL), DUTSON (TR) and SMITH (GC). Effect of electrical stimulation and steak temperature at the beginning of cooking on meat tenderness and cooking loss. J. Food Sci. 47(2); 1982; 687-8
- 1476 KANSAL (VK), MANCHANDA (S) and KRISHNAN (KR). Effect of castration/sterilization on eating quality and nutritive value of meat in male goats. J. Food Sci. Technol. (India) 19(5); 1982; 203-7
Male goats (Alphinex x Beetle (ross bred)) of 2, 4 and 6 months age were vasectomized or castrated by burdizzo or surgical removal of testes and were fed with standard diet until they attained 15 kg body weight when they were slaughtered and dressed. The scores for flavour, and juiciness for intact goats (control) did not differ from those of castrated or sterilized (by vasectomy) goats. Moisture content was similar in all goats; while protein was slightly higher in the meat of intact goats; fat content was higher in castrated and sterilized goats. Digestibility with pepsin and trypsin of meat protein was higher in goats castrated by burdizzo. KAR
- 1477 OCHI (H). Production and applications of bone extracts. Food Technol. 35(7); 1981; 58-9
Manufacturing of bone extracts and its uses have been discussed. KAR
- 1478 TERRELL (RN), SMITH (GC), HEILIGMAN (F), WIERBICKI (E) and CARPENTER (ZL). Cooked product temperature and curing ingredients affect properties of irradiated frankfurters. J. Food Prot. 44(3); 1981; 215-9
- 1479 BUSHWAY (AA), BELYEA (PR), TRUE (RH), WORK (TM), RUSSELL (DO) and McGANN (DF). Potato starch and flour in frankfurters; effect on chemical and sensory properties and total plate counts. J. Food Sci. 47(2); 1982; 402-4,408

BEEF

- 1480 NIEDZIELSKI (Z), ZAGRODZKI (S) and KRALA (L). Study of the control process for the thawing of beef quarters in an experimental tunnel through which air is passed.
Ind. Aliment. Agric. 97(10); 1980; 1071-7 (French)
Fore and hind quarters of beef were thawed in air at the following temperatures: 6,10,14,19, and 25 C; the linear velocity of the air current was 2 molecules, and the relative humidity 98%. The air was humidified in a column sprinkled with a 5% aqueous solution of NaCl. Taking into consideration the time required for thawing, the losses of mass, and organoleptic evaluation, the authors conclude that the best thawing temperature in an air tunnel is 14 C. At this temperature, the thawing time is 10 hour for fore quarters and 22 hour for hind quarters.
KMD
- 1481 LEE (CY), FUNG (DYC) and KASTNER(CL). Computer-assisted identification of bacteria on hot-boned and conventionally processed beef.
J. Food Sci. 47(2); 1982; 363-7,373
- 1482 DOLEZAL (HG), SMITH (GC), SAVELL (JW) and CARPENTER (ZL). Effect of time-on-feed on the palatability of rib steaks from steers and heifers.
J. Food Sci. 47(2); 1982; 368-73
- 1483 ABU-BAKAR (A), REAGAN (JO), WYNNE (RL) and CARPENTER (JA). Storage, functional and processing characteristics of pre- and postrigor beef preblends for wiener production.
J. Food Sci. 47(2); 1982; 374-9,385
- 1484 WIEBE (WR) Jr. and SCHMIDT (GR). Effects of vacuum mixing and precooking on restructured steaks.
J. Food Sci. 47(2); 1982; 386-7,396
- 1485 BLACKWELL (JH), RICKANSRUD (D), McKERCHER (PD) and McVICAR (JW). Effect of thermal processing on the survival of foot-and-mouth disease virus in ground meat.
J. Food Sci. 47(2); 1982; 388-92
- 1486 DOLEZAL (HG), SMITH (GC), SAVELL (JW) and CARPENTER (ZL). Comparison of subcutaneous fat thickness, marbling and quality grade for predicting palatability of beef.
J. Food Sci. 47(2); 1982; 397-401
- 1487 CALDIRONI (HA) and OCKERMAN (HW). Incorporation of blood proteins into sausage.
J. Food Sci. 47(2); 1982; 405-8
- 1488 WIEBE (WR) Jr. and SCHMIDT (GR). Effects of mixing and thermal processing on shelf-stable sectioned and formed beef.
J. Food Sci. 47(2); 1982; 409-11
- 1489 MILLER (GJ), FREY (MR), KUNSMAN (JE) and FIELD (RA). Bovine bone marrow lipids.
J. Food Sci. 47(2); 1982; 657-60,665
- 1490 SWATLAND (HJ), WARD (P) and TARRANT (PV). Electrical capacitance of dark-cutting beef.
J. Food Sci. 47(2); 1982; 686,688
- 1491 SCHINDLER (P), SCHMID (ER) and BECKER (R). Determination of trace elements in meat and liver of beef and pig by instrumental neutron activation analysis.
Z. Lebensmittel-Unters. Forsch. 171(2); 1980; 101-4 (German)
The concentration of three main and sixteen trace elements was determined in meat and liver samples of beef and pig using instrumental

neutron activation analysis. The resulting data are discussed by comparing them with concentrations recommended by WHO/FAO as maximum acceptable load for man. AA

- 1492 FISCHER (Chr), HONIKEL (KO) and HAMM (R). Influence of the velocity of freezing of prerigor beef on muscle metabolism and water holding capacity.
Z. Lebensmittel-Unters. Forsch. 171(2); 1980; 105-10 (German)
- 1493 VAN (JA), REAGAN (JO), CARPENTER (JA) and CAMPION (DR). The effects of meat type and formulation on the physical properties and sensory characteristics of nonspecific meat loaves.
J. Food Quality. 4(2); 1981; 113-9
- 1494 JEREMIAH (LE) and MARTIN (AH). The effect of electrical stimulation on the palatability and consumer acceptance of boneless rib steaks.
J. Food Quality. 4(3); 1981; 165-73
- 1495 JEREMIAH (LE) and MARTIN (AH). The effects of electrical stimulation upon the retail acceptability and case-life of boneless rib steaks.
J. Food Quality. 4(3); 1981; 175-84
- 1496 RAO (DR), REDDY (BM), SUNKI (GR) and PULUSANI (SR). Influence of antimicrobial compound(s) extracted from milk fermented by *Streptococcus thermophilus* on keeping quality of meat and milk.
J. Food Quality. 4(4); 1981; 247-58
Total and gram negative bacterial counts and pH in ground beef treated with methanol acetone (M-A) extract prepared from milk fermented by *Streptococcus thermophilus* were significantly less than the corresponding values in control beef on days 3 and 6 for all dose levels (upto 0.3 ml) tested. The total and gram negative bacterial counts on the surface of steaks sprayed with M-A extract were significantly lower than in the control. Inhibition of bacterial growth by M-A extract was significant both in milk stored at either R.T. or 5-7 C. M-A extract inhibited the growth of *Pseudomonas fluorescens* inoculated into milk. KAR
- 1497 MADHAVI (DL), SRINIVASAN (KS), KADKOL (SB) and BALIGA (BR). Essential amino acid content of buffalo meat.
J. Food Sci. Technol (India). 19(5); 1982; 214-5
Essential amino acid content of buffalo meat determined by microbiological assay, indicated that lysine is present in high concentration (8.9 g/100 g protein) and others are in adequate quantities. Chemical score for buffalo meat is 79 and phenylalanine and tyrosine are the first limiting amino acids, followed by isoleucine and tryptophan. The nutritional index for buffalo meat is 75. KAR

PORK

- 1498 AMUNDSON (CM), SEBRANEK (JG), KRAFT (AA), RUST (RE), WAGNER (MK) and GEHRKE (WH). Effect of packaging film and vacuum level on regular and sorbate-cured bacon.
J. Food Sci. 47(2); 1982; 355-8,362
Bacon was produced with either 40 ppm NaNO_2 /0.26% potassium sorbate, or 120 ppm NaNO_2 . Slices were packaged in either nylon/Surllyn or nylon/Saran/Surllyn pouches and sealed at either a high or intermediate vacuum level. At 0, 10, 21 and 28 days after packaging, residual nitrite, rancidity, pH, residual salt and pigment conversion were measured. Residual nitrite and pH were lower while nitrosopigment conversion was higher in bacon packaged with the high barrier film. Vacuum level, however, had no effect on any measured characteristic. The sorbate/reduced nitrite cure resulted in lower pigment conversion, lower residual nitrite, and a higher TBA number. AA

- 1499 PERCEL (PJ), PARRETT (NA), PLIMPTON (RF), OCKERMAN (HW), KROL (B) and VAN ROON (PS). Influence of tumbling and phosphate on the yield, sensory and chemical characteristics of pork liver loaf. J. Food Sci. 47(2); 1982; 359-62

- 1500 LENGERKEN (GV) and HENNEBACH (H). Fitness of the pH measurement for the ascertainment of faults of the meat quality of pigs (Part I & II). Fleisch. 33; 1979; (11) 213-215; (12) 237-239.

The results show that the pH, values and the fraction above and below the limiting value (PSE and DFD) inclination show considerable differences in different slaughter houses, on individual days of slaughter, at different points of measuring period corresponding to the chosen musculature C.M. *Longissimus dorsi* or M. *semimembranosus*). In the case of pigs with low PH₁ value in the ham musculature, too quick a glycogen breakdown in M. *longissimus dorsi* is observed (with an average of 70 to 80% certainty). On the other hand, conclusions can be drawn from the chop muscle, with regard to a high rate of glycogenolysis in the ham musculature, only with very low agreement (10 to 30%). Some conclusions are derived for the fitness of pH value measurement, especially under the conditions of routine slaughtering. KMD

CHICKEN

- 1501 ZOPHEL (KH). Partially mechanized method of cutting up of broilers in the VEB KIM Königs Wusterhausen. Fleisch. 33(11); 1979; 209-11 (German)

A new plant which can handle 900-1200 broiler carcasses per hour has been set up. The broilers are cut four times, to give 8 pieces. Productivity is thereby increased by 30-65%. The process differs from the existing standard TGL 8657/02, and a new standard will have to be prepared KMD

- 1502 KRAFT (A), REDDY (KV), HASIAK (RJ), LIND (KD) and GALLOWAY (DE). Microbiological quality of vacuum packaged poultry with or without chlorine treatment. J. Food Sci. 47(2); 1982; 380-85

- 1503 PRUSA (KJ), BOWERS (JA) and CHAMBERS (E). Instron measurements and sensory scores for texture of poultry meat and frankfurters. J. Food Sci. 47(2); 1982; 653-4

- 1504 ROBINSON (D), MEAD (GC) and BARNES (KA). Detection of chloroform in the tissues of freshly eviscerated poultry carcasses exposed to water containing added chlorine or chlorine dioxide. Bull. Environ. Contam. Toxicol. 27(2); 1981; 145-50

TURKEY

- 1505 TELLEFSON (CS), BOWERS (JA), MARSHALL (C) and DAYTON (AD). Aroma, colour, and lipid oxidation of turkey muscle emulsions. J. Food Sci. 47(2); 1982; 393-6

QUAIL

- 1506 SHARMA (N), KOWALE (BN) and JOSHI (HB). Effect of cooking and storage on cholesterol content of quail meat. J. Food Sci. Technol. (India) 19(5); 1982; 212-14

Thigh and breast muscles of quail were cooked and stored for 90 days at 4 and -10 C after packing in 150 gauge polyethylene bags. Samples stored at 4 C were analysed after 3, 6 and 9 days and those stored at -10 C after 30, 60 and 90 days for free cholesterol (FC) and esterified cholesterol (EC). In fresh thigh and breast muscles, cholesterol

contents were 1.04 and 1.18 mg/g respectively. 70% of the total cholesterol was present as FC and the remaining as EC. Both fractions of cholesterol decreased while cooking, but FC decreased significantly ($P < 0.05$). Cooked muscle stored at 4 C did not show significant change in FC and EC contents, but raw muscle EC decreased on storage. Storage at -10 C increased FC content significantly in raw muscle, but in cooked breast muscle both FC and EC changed significantly. KAR

- 1507 PANDEY (NK), MAHAPATRA (CM) and SINGH (RP). Changes in quality and acceptability of refrigerated quail (*Coturnix coturnix japonica*) eggs stored at room temperature.

J. Food Sci. Technol. (India). 19(5); 1982; 215-8

Quail eggs first held under refrigeration (5.0 ± 1 C and RH 80-85%) for 60 days were subsequently held at room temperature (28.8-32.7 C; RH 65.7-88.8%) for 5 days and the changes in egg quality were observed. Significant loss in egg weight, increase in air cell diameter and % yolk and decrease in albumen index, yolk index, % whole albumen and overall acceptance scores were observed. Observation made on 30, 45 and 60 days of refrigeration indicated increase in % loss in egg weight but no significant change in yolk and albumen index and shell thickness except increase in air cell diameter. pH of fresh whole albumen yolk and whole egg increased during post refrigeration storage. KAR

EGG

- 1508 O'BRIEN (SW), BAKER (RG), HOOD (LF) and LIBOFF (M). Water-holding capacity and textural acceptability of precooked, frozen whole-egg omelets.

J. Food Sci. 47(2); 1982; 412-7

Precooked, frozen omelets were analyzed for moisture loss, expressible moisture, shear force, and sensory evaluation to determine water-holding capacity and textural acceptability. Addition of 0.1% xanthan gum, application of moist heat in cooking, and cryogenic freezing with liquid carbon dioxide or nitrogen minimized moisture loss and shear force. Sodium carboxymethylcellulose (CMC), pregelatinized tapioca starch and sodium tripolyphosphate additives performed satisfactorily, but omelets containing xanthan gum were consistently rated highest in sensory evaluation of several treatments, including fresh and untreated control omelets. Steaming omelets for five minutes combined with cryogenic freezing produced a desirable omelet, requiring no additives. Steamed omelets were rated comparable to baked omelets in most sensory parameters. AA

SEAFOODS

- 1509 VIJAYABHARATHI (K), RAMAKRISHNAN (K) and SIVADAS (TK). Autobrinometer. Fish. Technol. 19(2); 1982; 105-7

This equipment can measure brine concentrations during blanching without disturbing the routine blanching operation. It consists of a platinum electrode sensor which is a glass tube of 15 cm length and 10 mm diameter with two platinum electrodes embedded inside, 5 cm apart. The sensor is enclosed in a PVC tube filling the interspace with araldite to make it rugged and insulated. The concentration of the brine is sensed by the electrodes and displayed in a moving coil meter. The instrument can measure 5 to 12% salt with an accuracy of $\pm 1\%$. Errors may occur due to temperature variations in the brine between 95 and 102 C and due to the unknown quantities of protein. MVG

- 1510 RAMAKRISHNAN (K), VIJAYABHARATHI (K) and SIVADAS (TK). Freezer temperature monitor and alarm. Fish. Technol. 19(2); 1982; 109-12

An electronic instrument for measuring freezer temperature in the

range of +40 to -40 C is described. The salient features of the instrument are remote display, (digital and analogue versions with an accuracy of ± 0.1 and 0.5 C respectively), and provision for continuous record of temperature. Two types of sensors using thermistor and P.N. junction of transistor were used for temperature sensing. MVG

FISH

- 1511 LEKSHMY NAIR (A) and GOPA KUMAR (K). Soluble protein isolates from low cost fish and fish wastes.
Fish. Technol. 19(2); 1982; 101-3
Protein isolates were prepared by hydrolysis with papain of comminuted fresh fish (Lizard fish, Jew fish, Threadfin bream, Cat fish, Perch and Milk fish) stored at -23 C. The yield of protein isolate for the above fish ranged from 7.5 to 13.3% and those for Cat fish and Jew fish waste the yield was 4.0 and 7.8 respectively. Proximate analysis showed that isolates contained about 90% protein on dry weight. Most samples were rich in lysine; the limiting amino acids being tryptophan and threonine. Rat feeding studies showed that its protein efficiency ratio (PER) was inferior to casein. However, supplementation with the limiting amino acids at 0.1% level or admixture with casein gave PER almost equivalent to casein. MVG
- 1512 ACRA (A), NAMAAN (S) and RAFFOUL (Z). Total mercury levels in canned and frozen fish imported into Lebanon.
Bull. Environ. Contam. Toxicol. 27(2); 1981; 209-12
- 1513 MURAMOTO (S). Influence of complexans (NTA, EDTA) on the toxicity of aluminum chloride and sulphate to fish at high concentrations.
Bull. Environ. Contam. Toxicol. 27(2); 1981; 221-5
- 1514 EIDE (O), BORRESEN (T) and STROM (T). Minced fish production from capelin (*Mallotus villosus*). A new method for gutting, skinning and removal of fat from small fatty fish species.
J. Food Sci. 47(2); 1982; 347-9, 354
- 1515 GILL (DA) and KROGER (M). Effects of various kitchen heat treatments, ultraviolet light, and gamma irradiation on mirex insecticide residues in fish.
J. Food Sci. 47(2); 1982; 350-54

SARDINE

- 1516 SURENDRAN (PK) and GOPA KUMAR (K). The bacteriology of oil sardine (*Sardinella longiceps*) and mackerel (*Rastrelliger Kanagurta*) caught from tropical waters off Cochin. I. Quantitative aspects.
Fish. Technol. 19(2); 1982; 89-96
Total aerobic viable plate counts (TPC) of skin, gills and intestines of fresh sardine and mackerel at 36 ± 1 C, 28 ± 2 C (room temperature, RT), 8 ± 1 C and 1 ± 1 C were estimated. At RT, TPCs of oil sardine and Indian mackerel were in the range of 10^3 to 10^7 and 10^4 to 10^6 /cm² in skin, 10^5 to 10^8 and 10^4 to 10^8 /g in the gills, and 10^5 to 10^9 and 10^5 to 10^8 /g in the intestines. Incubation temperature significantly affected TPCs. The highest count was obtained at RT. At 36 ± 1 C and 8 ± 1 C, the counts showed decrease by nearly 1-2 log. cycles than that at RT. The lowest count was recorded at 1 ± 1 C. The peak TPCs of these fishes occurred at different periods in the year. MVG

CARP

- 1517 MAKINODAN (Y), AKASAKA (T), TOYOHARA (H) and IKEDA (S). Purification and properties of carp muscle cathepsin D.
J. Food Sci. 47(2); 1982; 647-52

OYSTER

- 1518 HUSSONG (D), COLWELL (RR) and WEINER (RM). Seasonal concentration of coliform bacteria by *Crassostrea virginica*, the Eastern Oyster, in Chesapeake Bay.
J. Food Prot. 44(3); 1981; 201-3,208

SQUILLA

- 1519 MATHEW (PT), LAKSHMY NAIR (A) and PRABHU (PV). Squilla protein: Chemical composition and nutritive value.
Fish. Technol. 19(2); 1982; 97-100
Six batches of squilla protein were analysed and found to contain 64.6-68.5% of protein, 12.3-14.0% of ash and 5.8-10.3% of fat. Available lysine was 5.4%. All the essential amino acids were present in nutritionally adequate amounts except tryptophan (0.8/16 g N) and threonine (3.2 g/16 g N). Growth rates of rats and protein efficiency ratio were similar to those fed casein or a combination of squilla protein and casein (1:1) diet. Liver and kidney weight in rats fed squilla protein remained normal. MVG

PROTEIN FOODS

- 1520 KANSAL (VK) and SHARDA CHAUDHARY. Biological availability of calcium, magnesium and phosphorus from some infant and weaning foods.
Indian J. Nutr. Dietet. 18(11); 1981; 391-6
Biological availability of Ca, Mg, and P from some infant and weaning foods was studied on weanling albino rats. These minerals were less well utilized from infant foods than from cow's milk. The Ca retention factors were 0.865, 0.799, 0.752, 0.733 and 0.730 for cow's milk. Amul spray, Sapan, Indec and Lever spray respectively. The Mg and P retention factors were 0.771 and 0.693 for cow's milk, 0.520 and 0.635 for Amul spray, 0.417 and 0.6 for Sapan, 0.531 and 0.714 for Lever spray and 0.490 and 0.588 for Indec. Among weaning foods Balamul was found to be best source of these minerals. The available Ca/100 g weaning food was 659, 553, 449, 320 and 188 mg in, Balamul, Farex, Nestum-rice, Soy-whey, Nestum-all family cereal and Cerelac respectively. Biological availability of Mg from Nestum preparations was extremely poor, while from other weaning food it was moderate (35.5-51.4%). The availability of P was fairly good from Balamul and Farex (62.3 and 67.0 per cent respectively), moderate from Cerelac, Nestum-rice and Soy-whey (37.5-43.5%) and negligible from Nestum all family cereal (1.1%). AA

FRUIT JUICES AND BEVERAGES

- 1521 GIERSCHNER (K) and HERBST (R). Setting up chemical indices in the evaluation of the microbiological and hygienic condition of fruit juices and similar products. Part I.
Dtsch. Lebensmittel-Rundschau. 76(12); 1980; 433-6 (German)
- 1522 BIELIG (HJ). Storage and transport of concentrated fruit juices in large containers.
Flussiges Obst. 47(8); 1980; 343-6 (German)

BLACK ELDERBERRY

- 1523 WEISS (J) and SAMANN (H). Transformation of black elder berries into juice.
Flussiges Obst. 47(8); 1980; 346-50 (German)

ORANGE JUICE

- 1524 WALLRAUCH (S). Contribution to the composition of Brazilian orange juices and its dependence on the harvest time of the fruits. *Flussiges Obst*. 47(7); 1980; 306-11 (German)

Orange juice concentrates were examined during the period June 76 to 1979/80. The concentrations of important analytical parameters were recorded during the entire production time of two harvesting periods. The graphic representation of the concentration of these indices during the times of production shows that they depend on the harvesting time of the fruits; this way, important hints about the evaluation are given. The atmospheric conditions during these two years varied. A table providing a summary with indications of the average, of the standard fluctuation and of the fluctuation limits of important indices as well as the calculated scattering range ($P = 95\%$) show the typical composition of Brazilian orange juice. AA

- 1525 KANNER (J), FISHBEIN (J), SHALOM (P), HAREL (S) and BEN-GERA (I). Storage stability of orange juice concentrate packaged aseptically. *J. Food Sci.* 47(2); 1982; 429-31, 436

Orange juice concentrates were packed aseptically by a "Dole" aseptic canning machine using 6 oz metal cans. The final juice products (11, 34, 44, 58 Brix) were stored between -18 and 36 C and tested periodically for nonenzymatic browning, ascorbic acid destruction, furfural and sensory changes. Nonenzymatic browning, the main deterioration phenomena in these products, was satisfactorily retarded at 12 C or lower. Ascorbic acid destruction rate constant was dependent on temperatures between 5 and 25 C, and was affected by degree of juice concentration. Furfural accumulation in juice was higher than that in 58 Brix concentrate. Orange juice concentrate of 58 Brix did not show flavour changes after storage at 5 C or 12 C for 17 or 10 months, respectively, when evaluated after reconstitution to 11 Brix. AA

COFFEE

- 1526 PEARCE (RJ) and HARPER (WJ). A method for the quantitative evaluation of emulsion stability in coffee whiteners. *J. Food Sci.* 47(2); 1982; 680-81

TEA

- 1527 SRIMATI (V), SESHAGIRI (PB), RAJU (R) and RAMAKRISHNAN (S). Effect of coffee and tea on cholesterol and triacylglycerol of blood serum of humans and rats.

Indian J. Nutr. Dietet. 18(10); 1981; 360-64

In vegetarian male non-smokers, drinking of four to five cups of coffee with milk and sugar did not elevate blood cholesterol and triglycerides. In albino rats, there was actually a decrease of serum cholesterol and triglycerides in rats forced-fed with equivalent amounts of black coffee and tea for 20 days. The decrease was statistically significant in respect of tea only. Present work on humans and rats shows coffee drinking may not be harmful and tea is preferable to coffee. AA

- 1528 BANDHYOPADHYAY (S). Economic analysis of some critical problems of tea export of India.

Indian J. Agric. Econ. 37(3); 1982; 305-10

The paper analyses two problems facing India's tea export which include; (a) population explosion leading to increase in domestic consumption and (b) gradual decline in her share in the world export of tea. Other associated problems like low productivity, climatic reverses, high cost of production and paucity of suitable land and capital have also been covered. KMD

WINE

- 1529 SEEL (H). Membrane filters for the fruit wine industry. *Flussiges Obst*. 47(8); 1980; 335-7 (German)
- 1530 De SMEDT (P), LIDDLE (PAP), CRESTO (B) and BOSSARD (A). The analysis of non-volatile constituents of wine by glass capillary gas chromatography.

J. Inst. Brew. 87(6); 1981; 349-51

A considerable amount of quantitative and qualitative information on the non-volatile constituents of wine (acids, sugars and polyols) can be readily obtained, from small sample volumes without prefracti-
nation by glass capillary gas chromatography of their trimethylsilyl derivatives. A continuous check on the correct functioning of the method, and in particular on the inertness of the glass capillary and injector, is obtained by the use of two internal standards, whose trimethylsilyl derivatives vary considerably in stability. Any variation in the ratio of the peak areas of the latter derivatives indicates incorrect sample preparation or possible adsorptive/catalytic activity of the GC system. As a general method, the technique may be applied to other alcoholic beverages. AA

BEER

- 1531 DOLAN (TCS), DEWAR (ET) and GRAY (JD). Development and use of a method for determination of malt fermentability.
- J. Inst. Brew.* 87(6); 1981; 352-5
- A method for the determination of unboiled, filtered, malt hot water extracts has been developed. The wort is fermented under carefully controlled conditions using fresh distillers, yeast. Knowledge of a malt extract and fermentability allows calculation of its fermentable extract content, which allows spirit yield prediction, and the method is in use as a basis for malt purchase specifications. AA
- 1532 POLLOCK (JRA). Aspects of nitrosation in malts and beers. I. Examination of malts for the presence of N-nitrosoproline, N-nitrososarcosine and N-nitrosopipicolinic acid.
- J. Inst. Brew.* 87(6); 1981; 356-9
- 1533 BUCKEE (GK). Detection of the sulphuring of hops during kilning and cultivation.
- J. Inst. Brew.* 87(6); 1981; 360-64
- 1534 BAMFORTH (CW) and MARTIN (HL). β -Glucan and β -glucan solubilase in malting and mashing.
- J. Inst. Brew.* 87(6); 1981; 365-71
- 1535 PEPPARD (TL). Volatile organosulphur compounds in hops and hop oils. A review.
- J. Inst. Brew.* 87(6); 1981; 376-85
- 1536 PEPPARD (TL) and HALSEY (SA). Malt flavour. Transformation of carbonyl compounds by yeast during fermentation.
- J. Inst. Brew.* 87(6); 1981; 386-90
- 1537 DELCOUR (JA), VERHULST (LL), GEYS (R), DELIEVER (H) and DONDEYNE (P). Trimeric and oligomeric flavanoids in beer: A joint application of Sephadex LH-20 and reversed-phase gradient elution high-performance liquid chromatography.
- J. Inst. Brew.* 87(6); 1981; 391-3
- Flavanoids were separated from a commercial Belgian beer by adsorption on Sephadex LH-20 and desorption from this gel with an acetone-water mixture (60%). The resulting desorbates were analysed by reversed-phase gradient elution high-performance liquid chromatography. The

results clearly indicate that beer contains trimeric and higher oligomeric proanthocyanins. These polyphenols are not only important for the colloidal stability of a beer, but also for its flavour. AA

CIDER

- 1538 WILLIAMS (AA) AND MAY (HV). Examination of an extract of cider volatiles using both electron impact and chemical ionization gas chromatography-mass spectrometry.
J. Inst. Brew. 87(6); 1981; 372-5
- Gas chromatographic-mass spectrometric examination of the aroma components of a cider made from a single apple cultivar using both electron impact and chemical ionization has led to the identification of 38 compounds not previously reported in ciders. In comparison with electron impact spectra, chemical ionization generally gave a clearer indication of molecular weights and also a relatively simple and more readily interpretable fragmentation. Esters of succinic, malic and lactic acid were amongst the most significant of the components identified, the origin of these and other hydroxy acids are discussed. AA
- 1539 WVCHERPFENNIG (K). The importance of sulphurous acid in the cider production.
Flussiges Obst. 47(8); 1980; 331-4 (German)

WHISKY

- 1540 STRUNK (DH), TIMMEL (BM), HAMMAN (JW) and ANDREASEN (AA). Spectrophotometric determination of colour intensity of whisky.
J. Assoc. Off. Anal. Chem. 65(2); 1982; 224-6
- A method for measuring colour intensity of whisky was developed to replace the present AOAC method, which has become obsolete. The new method was collaboratively studied by 20 persons. Colour intensity of whisky was measured as absorbance by a spectrophotometer, using a 1 cm cell, a bandwidth ≤ 10 nm, and a wavelength of 525 nm. Water was used as reference. Collaborator results appear acceptable for whisky samples that vary in colour intensity from 29 to 374 CIU (absorbance $\times 1000$ = Colour Intensity Units (CIU)). The maximum standard deviation and coefficient of variation were 5.8 CIU and 6.68%, respectively. The method has been adopted for official first action. AA

OILS AND FATS

- 1541 FLESSNER(G). Oil bearing plant cultivation and utilization from the view point of agricultural policy.
Fette Seifen Anstrichm. 82(12); 1980; 469-73 (German)
- 1542 GRUNERT (D) and HELLER (W). Behaviour of free fatty acids after burning in animal experiments.
Fette Seifen Anstrichm. 82(12); 1980; 491-4 (German)
- 1543 MEIJBOOM (PW) and JONGENOTTER (GA). Determination of low erucic acid levels in oils and fats.
Fette Seifen Anstrichm. 82(12); 1980; 473-75
- In view of requirements set in 1979 by the European Community regarding the reduction of erucic acid levels in foods, the authors developed a method by which concentrations down to 0.1% can be determined. The procedure and conclusions are discussed in brief. AA
- 1544 GHANBARI (HA), WHEELER (WB) and KIRK (JR). Reactions of aqueous chlorine and chlorine dioxide with lipids: Chlorine incorporation.
J. Food Sci. 47(2); 1982; 482-5

- 1545 VAN NIEUWENHUYZEN (W). The industrial uses of special lecithins: A review.
J. Am. Oil Chem. Soc. 58(10); 1981; 886-8
The surface activity and ultimately the performance of commercial lecithin can be improved by physical, chemical or enzymatic methods. These methods are reviewed along with a brief survey of the use of special lecithins in certain food and non-food applications. Emphasis is placed on margarine, instant foods, leather fatting and mosquito control systems. AA
- 1546 LEE-SHIN TSAI and HUDSON (CA). High performance liquid chromatography of oxygenated cholesterol and related compounds.
J. Am. Oil Chem. Soc. 58(10); 1981; 931-4
- 1547 SCHENNETTEN (F). On the question of "inverse" relationship between LDL and serum cholesterol besides the index LDL:HDL.
Fette Seifen Anstrichm. 82(12); 1980; 482-7
The LDL values were determined according to Chod-pap, Burstein et al. and HDL, cholesterol and triglycerides by colorimetric, enzymatic and precipitation tests. β -Lipoproteins were determined partly according to Watson and partly by lipid electrophoresis; the differences obtained by the two methods were considered. Two groups of patients were studied. I = 24 pat. (13 males and 11 females) aged 20 to 80 years: II = 33 pat. in similar ratio. Following results were obtained. Group I :cholesterol. Most patients were below the normal value of 260 mg/dl (one patient had 354). LDL: most patients had values below 165 mg/dl (one patient had 277). The index (quotient LDL/cholesterol) was found to be between 0.19 and 0.79. Group II: Cholesterol 130 to 256 (arithmetic mean 207).mg/dl. Determination of β -lipoprotein according to Watson gives higher values than by conversion according to Burstein; thus in group II on an average 532 (between 263 and 641) mg/dl was found. A part of the cases in group I showed "inverse" relationship when the values of cholesterol and LDL are wide apart which results in a reduction of the index. AA
- 1548 FARAG (RS), OSMAN (SA), HALLABO (SAS), GIRGIS (AN) and NASR (AA). Linoleic acid oxidation catalysed by various amino acids and cupric ions in nonaqueous media.
Fette Seifen Anstrichm. 82(12); 1980; 487-90
- 1549 NAGARAJAN (MK) and VENKATARAMAN (B). Effect of surfactant micelles on homogeneous catalytic hydrogenation of 2,4-hexadienoic acid with penta-cyanocobaltate (III) - hydride complex.
J. Am. Oil Chem. Soc. 58(10); 1981; 939-42
- 1550 USUKI (R), FUKVI (H), KAMATA (M) and KANEDA (T). Accumulation of peroxides in pan frying oil.
Fette Seifen Anstrichm. 82(12); 1980; 494-497
Thermal oxidative deterioration and accumulation of peroxides (PO) in pan frying oils were discussed. Through several experiments, it was observed that the pan frying oils were extremely deteriorated and showed very high peroxide values (POV Ca 230), especially in the case of thin film heating. Pan frying oils were fractionated by silicic acid column chromatography and POV and thermostability of PO in each fraction were investigated. The results indicate that PO, accumulated during thin film heating, was not a specialized or thermostable PO. We conclude that the extensive formation of PO should show high POV during pan frying. AA
- 1551 GOPALA KRISHNAN (M), NIRMALA MENON and MATHEW (AG). Changes in the composition of clove oil during maturation.
J. Food Sci. Technol. (India) 19(5); 1982; 190-92
Cloves of 2,3 and 4 months (fully mature) maturity were analysed for oil content and other chemical characteristics; oil extracted from these were analysed for specific gravity refractive index, eugenol and

eugenol acetate content. The oil yield was 18.5, 18.8 and 16.7% at 2, 3 and 4 months maturity respectively; but the oil obtained at lower maturity stages of clove contained more of eugenol acetate and less of eugenol. With the maturation of clove, the eugenol, acetate concentration decreased from 26.0 to 9.0% and eugenol concentration increased from 48.2 to 68.3%. KAR

SPICES AND CONDIMENTS

- 1552 BAXTER (R) and HOLZAPFEL (WH). A microbial investigation of selected spices, herbs and additives in South Africa.
J. Food Sci. 47(2); 1982; 570-74, 578

A total of thirty-six spices, herbs and food additives from various sources was investigated. High total viable numbers of sporeformers were present of which a considerable percentage was proteolytic and/or amylolytic. The total number of colony forming units (c.f.u.) varied from several hundred to several million per gram, depending on the source, the manufacturing process, age and type of condiment. Exceptionally high contamination (i.e. $> 10^6$ c.f.u./g) was found in black pepper, coriander, paprika, mace, pimento and white pepper from source A. No significant numbers of potentially pathogenic organisms were found except for *B. cereus*, moulds and faecal streptococci. The presence of *B. cereus* was confirmed in 7 out of 19 samples from source A. Enterococci were isolated and identified from paprika, white pepper, black pepper, pimento, onion powder and salamita. The need for spice cleanliness, commercial sterilization and subsequent proper storage of condiments is stressed. AA

- 1553 BROWN (SM), ABBOTT (S) and GUARINO (PA). Screening procedure for uric acid as indicator of infestation in spices.
J. Assoc. Off. Anal. Chem. 65(2); 1982; 270-72

Uric acid levels in selected spice products were determined by using a glucose analyzer, modified and calibrated for uric acid. In the method, uricase is used to decompose the uric acid; the reaction is monitored with an oxygen-sensitive electrode. Uric acid levels correlated with infestation as determined by AOAC methods. AA

TURMERIC

- 1554 RAVEENDRAN (N) and AIYASWAMY (PK). An analysis of export growth and export prices of turmeric in India.
Indian J. Agric. Econ. 37(3); 1982; 323-5

The paper reviews the significant influence of promotional efforts on the export of turmeric and the need for setting up an Export Promotion Council for turmeric and giving price support to farmers. KMD

- 1555 SAMBAIAH, (K), RATAN KUMAR (S), KAMANNA (VS), SATYANARAYANA (MN) and RAO (MVL). Influence of turmeric and curcumin on growth, blood constituents and serum enzymes in rats.
J. Food Sci. Technol. (India) 19(5); 1982; 187-90

Turmeric (*Curcuma longa* L.) at 0.1 to 10% and curcumin at 0.1 to 2.0% level in the diet were fed to rats for 8 weeks period and their effect on growth, blood constituents and serum enzymes were observed. The food intake gain in weight and food efficiency ratio (FER) were not altered by turmeric upto 5.0% level or curcumin upto 2.0% level; at 10% level of turmeric, FER decreased significantly due to low diet intake. No change was observed in red blood cells, white blood cells, differential counts, on haemoglobin, total serum protein, albumin, globulin and serum amino transferase and alkaline phosphatase by the intake of turmeric or curcumin. KAR

CHILLI

- 1556 POKHARKAR (DS) and DETHE (MD). Studies on the residues of phosalone on chilli by GLC after multiband plate cleanup. J. Environ. Sci. Health. B16(5); 1981; 629-35

SENSORY EVALUATION

- 1557 DRUZ (L) and BALDWIN (RE). Taste thresholds and hedonic responses of panels representing three nationalities. J. Food Sci. 47(2); 1981; 561-3,569
Taste thresholds for sodium chloride, sucrose, citric acid and caffeine in aqueous solutions did not differ among panel from Nigeria, Korea, and the United States. The Nigerians and Koreans like tomato juice more than the Americans, and preferred it sweetened. The Koreans liked applesauce better than the other two nationalities, but did not differentiate among the sweetened applesauce, that contained sodium chloride and the control. Americans liked the control, and Nigerians liked the sweetened applesauce best. Frequency of consuming groups of foods by panelists was related to the trend towards liking tomato juice with sweet, sour, salty, and bitter, and applesauce with sweet and salty taste substances added, but there was no significant relationship between hedonic responses and thresholds. AA
- 1558 HOPPE (K). Contributions to the psychophysics of sweet taste. Part I. Goals and methods of investigation. Nahrung. 24(10); 1980; 967-79 (German)

FOOD STORAGE

Nil

INFESTATION CONTROL AND PESTICIDES

- 1559 APPAIAH (KM), RAMAKRISHNA (R), SUBBA RAO (R), NAGARAJA (KV) and KAPUR (OP). Spectrophotometric method of determination of carbofuran residues. J. Food sci. Technol. (India) 19(5); 1982; 211-2
A method has been developed for the determination of carbofuran (2,3-dihydro-2, 2-dimethyl-7-benzofuranyl methyl carbamate) residues based on its hydrolysis with methanolic potassium hydroxide to carbofuran phenol, which on reaction with 4-amino-antipyrine in the presence of an alkaline oxidizing agent produces an orange colour dye with an absorption maximum at 475 nm. The relationship between absorbance and concentration of carbofuran is linear in the range 0.5 to 20.0 µg/ml. Recovery of carbofuran from rice, wheat, jowar, pigeon pea, black gram and green gram when they were spiked with 30-240 µg of carbofuran ranged from 94.58 to 99.66%. The method can detect 0.3 ppm of carbofuran in foodgrains. AA
- 1560 FODOR-CSORBA (K), KOMIVES (T), MARTON (AF) and DUTKA (F). Extension of the AOAC multiresidue methodology for the determination of thiocarbamate herbicide residues in foods. Nahrung. 24(10); 1980; 963-5
- 1561 JACKSON (MD), HODGSON (DW), MacLEOD (KE) and LEWIS (RG). Evaluation of three sorbents for retention of PCBs in a natural gas stream. Bull. Environ. Contam. Toxicol. 27(2); 1981; 226-9

- 1562 MEINEN (VJ) and KASSERA (DC). Gas-liquid chromatographic determination of pyrethrins and piperonyl butoxide. J. Assoc. Off. Anal. Chem. 65(2); 1982; 249-55

BIOCHEMISTRY AND NUTRITION

- 1563 EGGER (RJ) and HERMUS (RJJ). Interpretation problems in epidemiological nutrition research. Voeding. 41(9); 1980; 324-8

It is suggested that the single values of the present recommended daily allowances (RDA) should be replaced by distributions, characterized by means, median values, and percentages (e.g. P₅ or P₉₅). If distribution analysis becomes common practice, one would obtain a more reliable assessment of the nutritional status of the population, as described in the distribution curve. The procedure will pinpoint at-risk categories in the population, and ultimately help to detect high risk individuals. Percentages, used as reference data, should be based on studies with a large enough population, for the required, narrow, confidence limits. KMD

- 1564 TESTER-DALDERUP (CBM). The requirements of a few minerals and trace elements from the standpoint of a total parenteral diet. Voeding. 41(10); 1980; 357-62

- 1565 SCHAAFSMA (G), Van BERESTEYN (ECH) and de WAARD (H). Calcium and phosphate in the human diet. 1. Requirements, recommendations, and new insights. 2. Relationship to blood thickness in post-menopausal women. Voeding. 41(9); 1980; 317-21, 322-3

1. Balance studies, as also a cross-sectional population survey, emphasize the need for a much higher calcium intake by adults than the practical allowance of 400-500 mg/day prescribed by FAO/WHO. It has been shown that high phosphorus diets lead to osteoporosis. Hence one should view any increase in the phosphorus intake of West Europeans with concern. 2. An investigation conducted on 53 post-menopausal women revealed a positive partial correlation between bone density of the distal third of the radius and calcium intake, and a negative one between bone density and phosphate intake. KMD

- 1566 PUSHPAMMA (P), GEERVANI (P) and KRISHNAKUMARI (K). Anthropometric and dietary pattern of adults and elderly population of Andhra Pradesh. Nutr. Rep. Int. 23(2); 1981; 229-35

An analysis of the nutrient intake revealed that the most limiting nutrients were β -carotene and vitamin C; only 40 to 60% of the requirement of riboflavin, calcium and thiamine was met. The adequacy of the calories ranged from 71 to 83%, protein from 80 to 90% and niacin from 67 to 76%. The intake of iron was just sufficient in adult males and elderly people and only 64% of the requirement was met in adult females. KAR

- 1567 BEYNEN (AC). Effects of dietary fat type on the plasma levels of low density and high density lipoprotein cholesterol in man. Voeding. 41(11); 1980; 395-8

Based on literature data, it is demonstrated that in normocholesterolemic men the dietary ratio of polyunsaturated to saturated fatty acids (P:S ratio) is inversely related to the plasma level of low-density lipoprotein cholesterol. The P:S ratio is directly associated with the ratio of high density lipoprotein cholesterol to non-high-density lipoprotein cholesterol. The concentration of plasma high-density lipoprotein cholesterol as a single parameter is not systematically influenced by the P:S ratio of the dietary fat. AA

- 1568 NUTRITION COUNCIL. Investigations on some aspects of the nutritional status of 15-16 year old school children.
Voeding. 41(12); 1980; 430-43
The indications of obesity, hypercholesterolaemia, and hypertension found in 15-16 year old children give cause for concern. The situation among trade (or vocational) apprentices is less favourable than in the general population. KMD
- 1569 SCHOUTEN (J). Vitamin deficiency in the aged as a cause of macrocytic anaemia.
Voeding. 41(12); 1980; 418-9
The author describes that out of 837 patients assessed in a geriatric department, 109 patients were found to have a low folate level. AA
- 1570 CRAMWINCKEL (AB), BOEIJEN (WGM) and ELVERS (JWH). A change in food choice model.
Voeding. 41(12); 1980; 425-9
The food choice model was developed as an aid to classify the health value of foodstuffs for schoolchildren. On the basis of chemical composition and relation to illness and malnutrition, all foodstuffs were divided into three groups. At first we placed foodstuffs rich in linoleic acids and low in vitamin content in the first group. This first group contains foodstuffs which have primarily desirable characteristics. Nuts, oils, etc. are in the second group with foodstuffs with desirable as well as less desirable characteristics. With this change, the system had become more logical as well as increased the public acceptance. AA
- 1571 RAO (AR), VIDYA SAGAR and PRASAD (D). Dietary fibre: update 1980. Indian J. Nutr. Dietet. 18(11); 1981; 397-407
Aspects covered include, definition and chemistry of dietary fibre, gut function and pathology, cholesterol and bile acid metabolism and carbohydrate absorption and metabolism. BSN
- 1572 SATTERLEE (LD). Proteins for use in foods.
Food Technol. 35(6); 1981; 53-4,55,62,64,66-71
The review covers among cereal proteins wheat, corn, sorghum and oat proteins, among legume proteins, leaf protein, and dry edible bean protein, among oilseed proteins, soy, peanut, sunflower, rapeseed, proteins, potato proteins, and among animal by-product proteins, blood proteins, cheese whey proteins, and finally the plasteins. KAR
- 1573 SATHE (SK) and SALUNKHE (DK). Preparation and utilization of protein concentrates and isolates for nutritional and functional improvement of foods.
J. Food Quality. 4(4); 1981; 233-45
Review article; Aspects considered include energy considerations, biochemical basis for protein utilization, production considerations, and utilization. KAR
- 1574 WEDER (JKP). Effect of supercritical carbon dioxide on proteins. Z. Lebensmittel-Unters. Forsch. 171(2); 1980; 95-100
- 1575 FRIEDRICH (M), SCHENK (G) and NOACK (R). Studies on the physiological importance of the microvilli-bound leucine arylamidase in the final digestion of proteins. Part IV. The inhibition of the microvilli-bound leucine arylamidase by free amino acids.
Nahrung. 24(10); 1980; 989-95 (German)
The microvilli-bound leucine arylamidase is inhibited by certain amino acids. An inhibitory action is exerted by the branched-chain amino acids L-leucine and L-isoleucine and by the aromatic amino acids, L-tyrosine and L-phenylalanine with K_i values of $4-6 \cdot 10^{-3}$ M. L-methionine ($K_i = 2.5 \cdot 10^{-3}$ M) and its higher homologue L-ethionine ($K_i = 1.1 \cdot 10^{-3}$ M) are the most potent inhibitors. Derivatization of L-methionine, on the sulphur or the nitrogen atom, on the carboxyl group, prevents the inhibitory effect just as the D-isomer does. AA

- 1576 MATSUDA (T), WATANABE (K) and SATO (Y). Interaction between ovomucoid and lysozyme.
J. Food Sci. 47(2); 1982; 637-41
- 1577 LABUZA (TP) and KAMMAN (JF). Comparison of stability of thiamin salts at high temperature and water activity.
J. Food Sci. 47(2); 1982; 664-5
- 1578 TRAVER (LE), BOOKWALTER (GN) and KWOLEK (WF). A computer-based graphical method for evaluating protein quality of food blends relative to cost.
Food Technol. 35(6); 1981; 72-8

TOXICOLOGY AND HYGIENE

- 1579 TAM (T-Y) and TREVORS (JT). Toxicity of pentachlorophenol to *Azotobacter vinelandii*.
Bull. Environ. Contam. Toxicol. 27(2); 1981; 230-34
- 1580 KAPEGHIAN (JC), WATERS (IW) and JONES (AB). A simplified method for sampling atmospheric ammonia from inhalation chambers during exposure studies.
Bull. Environ. Contam. Toxicol. 27(2); 1981; 282-7
- 1581 POLVINO (DA) and BERNARD (DT). Media comparison for the enumeration and recovery of *Clostridium sporogenes* P.A. 3679 spores.
J. Food Sci. 47(2); 1982; 579-81
- 1582 SMITH (TL), MORAN (JW) and WITTER (LD). Thermal inactivation of L-Glutamic acid decarboxylase from *Escherichia coli*.
J. Food Prot. 44(3); 1981; 213-4
- 1583 STERN (NJ) and DAMARE (JM). Comparison of selected *Yersinia enterocolitica* indicator tests for potential virulence.
J. Food Sci. 47(2); 1982; 582-4,588

GENERAL

- 1584 ANON. World food problems: The main issues.
Food Trade Rev. 51(10); 1981; 545,547-8,550,555,557
- 1585 KAHN (SG). World hunger: An overview.
Food Technol. 35(9); 1981; 93-8
The author after reviewing the world hunger situation, discusses about some of the technical approaches like, post harvest losses, nutrient value of foods, weaning foods, nutrient deficiencies, national surveys, distribution system and communication systems that are currently being taken. KAR
- 1586 DHARMA RAO (G). Rural poverty in India. An analysis.
Southern Econ. 20(12); 1981; 9-12
- 1587 RADTKE (LH) and RODRIGUEZ (NC). In-house preference testing: An R & D resource.
Food Technol. 35(11); 1981; 67-9
The advantages of in-house preference testing and under what conditions, it will be useful, have been provided. KAR
- 1588 ANON. Food/Drug incompatibilities.
Br. Food J. 83(904); 1981; 132-3,145
- 1589 WORLD HEALTH ORGANIZATION. Alcohol problems: A growing threat to health.
WHO Chronicle. 36(6); 1982; 222-5
Dangers of alcohol consumption, consumption pattern, types and extent of alcohol problems, and areas of priority action are the aspects covered. KAR
- 1590 LECHOWICH (RV). Food ingredient safety evaluation.
Food Technol. 35(12); 1981; 69-70
Changes in safety evaluation, recent developments and current needs, and benefit and risk considerations. KAR
- 1591 MIDDLEKAUFF (RD). Food safety review in Congress.
Food Technol. 35(12); 1981; 84-7
The author evaluated the essential elements of the safety review program, in the light of the authority for such a program as it exists in the current Act; reviewed suggestions for possible new interpretations of the Act and discussed the current thinking in the congress for a legislative improvement of the Act. KAR
- 1592 SZE (MC). Meeting the information needs of food scientists through computerized literature searching.
Food Technol. 35(10); 1981; 92-7
Searching different data bases and the precision accomplished in the supply of information are discussed. KAR

FOOD PROCESSING AND PACKAGING

- 1593 BOURLAND (CT), FOHEY (MF), RAPP (RM) and SAUER (RL). Space shuttle food processing and packaging.
J. Food Prot. 44(4); 1981; 313-9
- 1594 SMITH (EA). Simulation of grain drying when air-flow is non-parallel.
J. Agric. Eng. Res. 27(1); 1982; 21-33
Much work has been done on simulating the drying process in grain beds where air flows in parallel streamlines. This paper presents a method of simulating drying which can be used on any shape of streamline, that is on any shape of grain heap. Isotraverse lines, which

have often been used to give the shape of a drying front, can be used to simplify the calculation. Also it is shown that although isotherms are close to lines of constant moisture content, temperature and humidity, they are not coincident with them. AA

FOOD ENGINEERING AND EQUIPMENT

- 1595 BROOK (RC). Use of microcomputers for process control. Food Technol. 35(10); 1981; 89-91
Process control applications have been discussed under time based control, event based control and process-condition-based control and the future avenues of development have been explored. KAR

ENERGY IN FOOD PROCESSING

- 1596 RAY (HS). Energy conservation. A reliable alternative source of energy. Sci. Rep. 20(6); 1983; 322-6

FOOD CHEMISTRY AND ANALYSIS

- 1597 FISCHER (PWF) and L'ABBE (M). Iodine in iodized table salt and in sea salt. Can. Inst. Food Sci. Technol. J. 13(2); 1980; 103-4
- 1598 KINSELLA (JE). Functional properties of proteins: Possible relationships between structure and function in foams. Food Chem. 7(4); 1981; 273-88
In this paper, the nature of food foams, the possible relationships between the molecular structure and the foaming capacity of different proteins and factors effecting these are given. KAR
- 1599 BARRATT (RS). The preparation of standard gas mixtures. A review. Analyst. 106(1265); 1981; 817-49

FOOD LAWS AND REGULATIONS

Nil

FOOD MICROBIOLOGY

- 1600 HANLIN (JH), CLOUTIER (MJ) and SLEPECKY (RA). Heat sensitization of bacterial spores after exposure to ethidium bromide, acriflavine, or daunomycin. Appl. Environ. Microbiol. 42(1); 1981; 79-82
- 1601 PATEL (GB) and AGNEW (BJ). A simple apparatus for measuring the E_h of anaerobic media. Can. J. Microbiol. 27(8); 1981; 853-5
- 1602 ZIMMER (G), GRUNDKE (E) and ULRICH (L). New appliance for the supply of oxygen to microorganisms in liquid media. Lebensmittel industrie. 27(10); 1980; 448-51 (German)
The advantages of this new appliance are as follows: (1) a stable, continuous fermentation is possible; (2) a high rate of oxygen supply can be realised with low energy consumption; (3) movable construction

elements and/or special pumps are not required; (4) the construction and installation are simple; and (5) the initial cost is low. KMD

- 1603 LINEK (V), BENES (P), HOVORKA (F) and HOLECEK (O). Use of glucose oxidase system in measuring aeration capacity of fermentors. Comparison of the dynamic and steady-state methods of K_1a measurement. *Biotechnol. Bioeng.* 23(7); 1981; 1467-84
- 1604 SZETELA (RW) and WINNICKI (TZ). A novel method for determining the parameters of microbial kinetics. *Biotechnol. Bioeng.* 23(7); 1981; 1485-90
- 1605 ANDRE (G), MOO-YOUNG (M) and ROBINSON (CW). Improved method for the dynamic measurement of mass transfer coefficient for application in solid-substrate fermentation. *Biotechnol. Bioeng.* 23(7); 1981; 1611-22
- 1606 LESNIAK (W) and STAWICKI (S). Semi-continuous fermentation of citric acid by submerged fermentation. *Acta Aliment. Polonica.* 5(4); 1979; 366-77
The semi-continuous fermentation of citric acid was carried out at a temperature of 30 C on a synthetic medium (sucrose+mineral salts) using the *Aspergillus niger* B-64-5 strain. The acid-forming activity of the mould and its morphological properties were found to change gradually during the cultivation period of 16-32 days. Compared with batch fermentation, a 20-50% increase in the productivity of the citric acid was obtained, depending on the dilution rate, the yield having been maintained on the same level. AA
- 1607 KIEL (H), GUVIRIN (R) and HENIS (Y). Citric acid fermentation by *Aspergillus niger* on low sugar concentrations and cotton waste. *Appl. Environ. Microbiol.* 42(1); 1981; 1-4
- 1608 GARG (SK) and NEELAKANTAN (S). Effect of cultural factors on cellulase activity and protein production by *Aspergillus terreus*. *Biotechnol. Bioeng.* 23(7); 1981; 1653-9
- 1609 CANEVASCINI (G) and GATTLEN (C). A comparative investigation of various cellulase assay procedures. *Biotechnol. Bioeng.* 23(7); 1981; 1573-90
- 1610 PETERKIN (PI) and SHARPE (AN). Filtering out food debris before microbiological analysis. *Appl. Environ. Microbiol.* 42(1); 1981; 63-5
- 1611 KAY (WW). Purification by affinity chromatography of a membrane dicarboxylate binding protein from *Bacillus subtilis*. *Can. J. Microbiol.* 27(8); 1981; 795-800
- 1612 EVANS(E) and WITTY (R). Use of *Tetrahymena pyriformis* to determine the quality of food proteins: A review. *Can. Inst. Food Sci. Technol. J.* 13(2); 1980; 50-55
Discusses: nutrient requirements of *T. pyriformis*; nutritional factors affecting *T. pyriformis*; and comparison with other protein quality procedures. BSN
- 1613 TANAKA (N), KUSUNOKI (M), BANDO (S) and KAKUDO (M). Three dimensional structure of taka-amylase A. *J. Jpn. Soc. Starch Sci.* 28(2); 1981; 53-8 (Japanese)
- 1614 MORITA (Y), MIKAMI (B) and AIBARA (S). Structure and function of β -amylase. *J. Jpn. Soc. Starch. Sci.* 28(2); 1981; 59-66 (Japanese)

- 1615 SHINKE (R) and NISHIRA (H). β -amylase production by microorganisms. J. Jpn. Soc. Starch Sci. 28(2); 1981; 67-71 (Japanese)
A rifampin-resistant, asporogenous mutant, BQ10-S1 Spo⁻, having highly potent β -amylase productivity was isolated from *Bacillus cereus* BQ10-S1. A sporogenous revertant, BQ10-S1 Spo⁺, was also obtained from BQ10-S1 Spo⁻. Bacteriological characteristics of these mutants and their ways of β -amylase production were compared. The relationship between high β -amylase productivity and sporulation of rifampin-resistance has been discussed. AA
- 1616 HUANG (SY) and CHU (W-B). Automatic control for fed-batch culture of single cell protein. Biotechnol. Bioeng. 23(7); 1981; 1491-9
- 1617 GHOSH (BB), BANDYOPADHYAYA (R) and SARKAR (AK). Physiological studies on the internal organs and haematology of rats fed on single cell protein of bacterial origin. Sci. Cult. 48(7); 1982; 247-50
Albino rats were fed daily with their normal diet, 10% of casein (control), SCP (prepared from *Arthrobacter simplex*) and SCP + methionine for 43 days. No abnormal increase or decrease was evident in haemoglobin content, haematocrit value, total RBC, WBC and differential WBC count in experimental rats. Tissue weight of SCP fed rats showed a general tendency to increase as compared to those fed casein or SCP + methionine, the organs most affected being the adrenals, lungs, testes and pancreas. Except in pancreas and testes increased weight of most other organs came closer to control when methionine was added to diet. But, the weight of adrenals was reduced by 8.8% with methionine supplementation indicating some untoward effect of excess methionine over adrenals. Histologically, the three groups were normal except for some changes in gonads in experimental animal. After SCP diet, there were some changes in testicular activity evidenced by the increased number of primary and secondary spermatocytes, spermatids and spermatozoa in the seminiferous tubules. But, with SCP, methionine inhibited this increase. This was attributed possibly to the power of SCP to stimulate spermatogenesis, while SCP + methionine inhibited it. MVG

YEAST

- 1618 GUIRAUD (JP), DAURELLES (J) and GALZY (P). Alcohol production from Jerusalem artichoke using yeasts with inulinase activity. Biotechnol. Bioeng. 23(7); 1981; 1461-5
The obtaining of a fermentable extract from Jerusalem artichoke is simple. Yeasts with inulinase activity can be used to produce ethanol with good profitability. The method makes it possible to obtain 25 to 65 hl ethanol/ha with by-products usable as feed. AA
- 1619 VANOSSI (L). Mevalonic acid of yeast. Ind. Aliment. 21(1); 1982; 31-2 (Italian)
A brief review of the biochemistry of mevalonic acid (vitamin B₁₃) which is found in dry yeast. KMD
- 1620 DOMON (MH), MATHIEU (LG) and De REPENTIGNY (J). Changes in the activity of antifungals in mixed cultures of bacteria and yeasts. Can. J. Microbiol. 27(8); 1981; 843-6

ALGAE

- 1621 CHOI (YR) and MARKAKIS (P). Blue green algae as a source of protein. Food Chem. 7(4); 1981; 239-47
Method of extraction of protein from *Anabaena flos-aquae*-a blue green algae is given. It is easily digested by pepsin *in vitro* and is deficient in S-amino acids. KAR

- 1622 KOBVRGER (JA). Effect of frozen storage on fungi in foods.
J. Food Prot. 44(4); 1981; 300-301

MUSHROOM

- 1623 KLEYN (JG) and WETZLER (TF). The microbiology of apent mushroom compost and its dust.
Can. J. Microbiol. 27(8); 1981; 748-53
- 1624 NOVAES-LEDIEU (M) and MENDOZA (CG). The cell walls of *Agaricus bisporus* and *Agaricus campestris* fruiting body hyphae.
Can. J. Microbiol. 27(8); 1981; 779-87
- 1625 SARKAR (BB) and CHAKRAVARTHY (DK). Use of polypropylene bags as containers for mushroom spawn.
Sci. Cult. 48(6); 1982; 219-20
Polypropylene bags are susceptible for contamination as they very often crack during sterilisation. Higher gauge bags were therefore, used but only with marginal improvement. Use of double packets, however, significantly reduced contamination, irrespective of the thickness of the polypropylene sheets used. Introduction of fresh air during inoculation by twisting of the packets below the neck was necessary to effectively reduce contamination. MVG
- 1626 SCHELLMANN (B), HILZ (M-J) and OPITZ (O). Fecal excretion of cadmium and copper after mushroom (*Agaricus*) diet.
Z. Lebensmittel-Unters. Forsch. 171(3); 1980; 189-92 (German)
High contents of cadmium in some *Agaricus* species led to the warning that the eating of wild grown mushrooms may bear the possibility of cadmium intoxication. The low digestion rate due to the chitin membrane of fungi was not discussed. Therefore, in this investigation, the cadmium and copper concentrations in feces of five subjects were estimated before and after a three day mushroom diet. The high concentrations of fecal cadmium and copper observed after starting the diet confirm the suggestion, that fungi consumed mostly pass through the intestinal tract unscathed without resorption. Hence, even larger ingestion of *Agaricus* fungi may not cause cadmium intoxication in humans. AA

FOOD ADDITIVES

- 1627 FULTON (KR). Surveys of industry on the use of food additives.
Food Technol. 35(12); 1981; 80-83
The report of the survey conducted by the National Academy of Sciences for the FDA. Details of the survey including the methodology are given. KAR
- 1628 ELTON (GAH). Additives and contaminants in the food supply.
Food Technol. Aust. 33(4); 1981; 184-8
The paper discusses short-term and long-term risks; testing procedures for food additives; carcinogens in the food supply; and examples for food additives (nitrites and saccharin) and also for contaminants (heavy metals and aflatoxin). KAR
- 1629 LUCK (E). Chemical preservation of foods: Yesterday, today, tomorrow.
Ind. Aliment. 21(1); 1982; 1-11 (Italian)
Despite the increasing prevalence of physical methods of food preservation, the use of chemicals is still unavoidable. There are some risks attached to the use of SO₂ and of nitrite, but these preservatives are still indispensable at the levels currently employed in food technology today. Tests have shown that, by using the relatively harmless sorbic acid, it is possible to use smaller amounts of nitrite.
KMD

- 1630 BIRNBAUM (H). The monoglycerides: Manufacture, concentration, derivatives and applications.
Baker's Dig. 55(6); 1981; 6-18
- 1631 FOGG (AG) and BHANOT (D). Further voltammetric studies of synthetic food colouring matters at glassy carbon and carbon paste electrodes using static and flowing systems.
Analyst. 106(1265); 1981; 883-9

Linear-sweep anodic peaks of synthetic food colouring matters at a stationary carbon paste electrode have been found to be generally sharper, to be better resolved from the cut-off current and to have a lower base-line current than those obtained at a glassy carbon electrode. All of the food colours studied also gave cathodic peaks at a stationary glass carbon electrode but there was fluctuation of peak potential and instability of peak shape with some colours. The cathodic peak potentials of the yellow food colours were particularly well separated. The more limited negative potential range available with carbon paste restricted study to ten food colours. The voltammetric waves of four food colours showed some reversibility when studied by cyclic voltammetry. The anodic peaks of the triphenylmethane colours, Green S. Patent Blue V and Brilliant Blue FCF, show small peaks on the reverse scan. Indigo carmine is unique in having a large peak on the reverse scan of the cathodic peak. Carbon paste and glassy carbon electrodes used anodically in the wall-jet configuration have been shown to give good precision, rectilinear calibration graphs and low limits of detection for the determination of food colours by flow-injection analysis. AA

CEREALS

- 1632 PRENTICE (N). Purification of beta-glucanase for beta-D-glucan assays.
Cereal Chem. 59(3); 1982; 231-2
- 1633 ELLIS (R) and MORRIS (ER). Comparison of ion-exchange and iron precipitation methods for analysis of phytate.
Cereal Chem. 59(3); 1982; 232-3
- 1634 EL-HINNAWY (SI), EL-GHOBASHY (RE), SHATLA (MA) and EL-SAKR (AS). Proteins of cereal germs.
Egypt. J. Food Sci. 9(1-2); 1981; 31-8
Germs of wheat, maize and rice were analyzed to determine their amino acids, lysine 6.41, 3.15, 3.73 mg/g leucine; isoleucine 16.39, 7.05, 16.14 mg/g; tryptophan 3.31; 0.45 and 4.15, threonine 5.09, 2.92 and 5.86 mg/g respectively. The chemical scores were 14.21, 19.62 and 7.73 respectively. Their limiting amino acid was methionine. AA
- 1635 SHEWRY (PR). Squeezing more protein from deficient cereals.
Mill. Feed. Fert. 164(11); 1981; 30-31
- 1636 EL-HINNAWY (SI), EL-GHOBASHY (RE), SHATLA (MA) and EL-SAKR (AS). Lipids in cereal germs.
Egypt. J. Food Sci. 9(1-2); 1981; 39-48
The fatty acids in wheat, maize and rice germ oils were, oleic 27.8, 27.03 and 17.81%, linoleic 41.87, 39.9 and 19.22% and linoleinic 2.37, 1.97 and 15.56% respectively. The main triglycerides were G (SOL) 15.55%, G (O3) 14.29% and G (S-L) 14.29% in wheat germ oil, G (OL₂) 20.83% and G (SL₂) 18.18% in maize germ oil and G (O₂L) 17.10%, G (SOL) 16.73% and G (OL₂) 16.36% in rice germ oil. AA
- 1637 RAEMY (A) and LOLIGER (J). Thermal behaviour of cereals studied by heat flow calorimetry.
Cereal Chem. 59(3); 1982; 189-91

Heat flow calorimetry was used for studying the thermal behaviour of cereals above 20 C. When the samples were heated in sealed measuring cells, intense exothermic reactions were observed at about 170 C. These exothermic reactions, which are associated with roasting and carbonization of the foods, were mainly attributed to carbohydrates. AA

RICE

- 1638 VILLAREAL (RM) and JULIANO (BO). Properties of albumins of milled rice.

Phytochemistry. 20(8); 1981; 1785-9

Extraction studies on IR36 milled rice showed that albumins solubilized by 0.1-0.15M $(\text{NH}_4)_2\text{SO}_4$ consisted of about 20% high (~5%) lysine, fast-migrating proteins on electrophoresis at pH 8.3 and about 80% lower (~2%) lysine proteins of slower mobility. The 2%-lysine albumins were insoluble in 1.8M $(\text{NH}_4)_2\text{SO}_4$ while the higher lysine albumins required 4 M $(\text{NH}_4)_2\text{SO}_4$ to precipitate. The 2%-lysine albumins were not fractionated by gel filtration and gave only one major fraction with MW 19000. SDS-polyacrylamide gel electrophoresis confirmed the major subunit to be of MW 17000. These albumins were separated by DEAE-Sephacel chromatography at pH 8.5 into three fractions of similar aminograms but differing in analytical gel electrophoretic and isoelectric focusing patterns. AA

- 1639 PILLAIYAR (P) and RAMACHANDRAN (K). Automation in rice milling. An analysis.

Madras Agric. J. 69(3); 1982; 203-5

The difficulties encountered after the introduction of modern rice mills in India under the cooperative sector in 1964 and a low cost method of modernising huller mills as per this method of Paddy Processing Research Centre, Tiruvarur (India) along with the advantages have been reviewed in this article. KAR

- 1640 MOHANDOSS (R) and PILLAIYAR (P). Influence of parboiling and drying methods on the quality of parboiled rices.

Madras Agric. J. 69(3); 1982; 185-93

The influence of parboiling and dehydration on the hydration, cooking and eating qualities of rices were determined in three varieties by subjecting them to 4 parboiling (single steaming (SS), double steaming (DS), hot soaking (HS) and pressure parboiling (PP)) and 4 dehydration (either retention in hot condition for 30 minutes followed by drying in shade (RS) and mechanically (RM) or transferring immediately and drying in thin layer in shade (S) and mechanically (M)) conditions. The intensity and duration of the heat treatment at the time of parboiling as well as during dehydration step seem to alter the quality to a great extent; severe the heat treatment, greater is the change in the property and vice versa. Even while employing identical processing conditions, the extent of quality alteration differs among varieties. Not only the GT, but also other factors seem to influence the varietal response to parboiling. KAR

- 1641 IWASAKI (T), SHIBUYA (N), SUZUKI (T) and CHIKUBU (S). Gel filtration and electrophoresis of soluble rice proteins extracted from long, medium and short grain varieties.

Cereal Chem. 59(3); 1982; 192-5

Proteins were extracted from milled rice of long, medium, and short grain varieties with 5% sodium chloride and were separated by ammonium sulphate precipitation into albumin and globulin fractions. These were then investigated by gel filtration, starch-gel electrophoresis, and amino acid analysis. Both albumins and globulins gave four fractions by gel filtration. Molecular weights of albumins ranged from 10,000 to 200,000; those of globulins ranged from 16,000 to 130,000 (the fourth globulin fraction was not determined). Starch-gel electrophoresis gave about 20 bands for both albumins and globulins. Some differences were

noted that support the idea of classifying rice varieties into groups by differences in electrophoretic patterns. Amino acid analysis of albumins and globulins showed several differences among the three varieties. AA

- 1642 SHANTHY (AP), SOWBHAGYA (CM) and BHATTACHARYA (KR). Simplified determination of water insoluble amylase content of rice. Starch. 32(12); 1980; 409-11

The traditional "starch-iodine blue value" of rice gives the hot water soluble amylose content of rice, but previous defatting is essential for its correct determination as amylose by iodine colorimetry. Since defatting of flour is laborious and time consuming, the hot water extract of rice flour is defatted by shaking with petroleum ether. Colour is then developed with iodine and read at 630 nm against an amylose standard. Subtracting the above value from the total amylose content gives the insoluble amylose content. AA

- 1643 BRADBURY (JH) and COLLINS (JG). Lipids of the major histological components of rice studied by ^{13}C nuclear magnetic resonance spectroscopy. Cereal Chem. 59(3); 1982; 159-62

^{13}C Nuclear magnetic resonance (NMR) spectroscopy of rice and its histological components allowed the determination of 1) the amount of lipid in each component (22% in endosperm, 56% in aleurone cells plus grain coat, and 22% in embryo), 2) the amount of aleurone cells plus grain coat plus embryo (9.5%) in brown rice, 3) the ratio of saturated to unsaturated fatty acids in the embryo, endosperm, and aleurone cells plus grain coat (7,5,6,1 and 5.4 respectively), and 4) the fact that enzyme lipase is located in the aleurone cells plus grain coat. The amount of lipid in brown rice is 3.6%, in endosperm 0.87%, in aleurone cells plus grain coat 31%, and in embryo 31.7%. The ^{13}C NMR spectrum of lipid extracts of brown rice studied in solution was much sharper than that obtained from the solid material and allowed full evaluation of the lipid composition. The NMR results agreed with those obtained by gas chromatography and averaged, for triglyceride esters: 16:0, 25.9%; 18:1, 39.2%; and 18:2, 34.9%. At 67.89 MHz, small ^{13}C NMR resonances were observed and were assigned to phosphatidylcholine, phosphatidylethanolamine, lysophosphatidylcholine, and lysophosphatidylethanolamine. AA

- 1644 NWANA (IE) and AKIBO-BETTS (DT). The resistance of some rice varieties to damage by *Sitophilus zeamais* Motschulsky during storage. Trop. Stored Prod. Inf. No. 43; 1982; 10-15

Milled and unmilled samples of 13 rice varieties were infested for 7 days with 4 male and 8 female *Sitophilus zeamais* adults, all 7-14 days old. The varieties were chosen for high yield, resistance to field pests or early maturity. Cultures were maintained at 27-30 C and 60% rh. Estimates of resistance were obtained as indices of susceptibility using Howe's formula and as measurements of grain damage derived from corrected weight losses. Varieties with perfect husks were generally the more resistant. Hairs on the husk also affected resistance, but the relationship between hairiness and resistance was not determined. No varietal differences were detected between milled rice samples which, in all cases, suffered more damage than unmilled samples of the same variety. AA

- 1645 HANSEN (LP), HOSEK (R), CALLAN (M) and JONES (FT). The development of high-protein rice flour for early childhood feeding. Food Technol. 35(11); 1981; 38-42

The raw material quality, the nutritional value of these raw materials, enzymatic production of high protein rice flour and the nutritional benefits of high protein rice flour have been discussed. KAR

- 1646 IWAMOTO (M), NORRIS (KH) and KIMURA (S). Rapid prediction of chemical composition for wheat, soyabean, pork and fresh potatoes by near infrared spectrophotometric analysis. J. Jpn. Soc. Food Sci. Technol. 28(2); 1981; 85-90

Near infrared spectrophotometric technique was examined to confirm the feasibility of predicting some major compositions of wheat, soyabeans, pork and fresh potatoes. Two commercial types of instruments were used in order to check the characteristics by combining an in-house designed precise instrument simultaneously. It was concluded that the technique had a high potential for predicting protein of wheat and soyabean, and fat and moisture of pork. As for sliced fresh potatoes, an electrical noise was rather too serious to derive good results. However, judging from the features of the second derivative of transmittance spectrum, it was possible to believe that there was a feasibility still assured for predicting the composition of potatoes. AA

1647 CIACCO (CF) and D'APPOLONIA (BL). Characterization and gelling capacity of water-soluble pentosans isolated from different mill streams. *Cereal Chem.* 59(3); 1982; 163-6

1648 KILBORN (RH) and PRESTON (KR). A dough sheeting and molding property indicator. *Cereal Chem.* 59(3); 1982; 171-4

1649 LOOKHART (GL), JONES (BL), HALL (SB) and FINNEY (KF). An improved method for standardizing polyacrylamide gel electrophoresis of wheat gliadin proteins. *Cereal Chem.* 59(3); 1982; 178-81

1650 JONES (BL), LOOKHART (GL), HALL (SB) and FINNEY (KF). Identification of wheat cultivars by gliadin electrophoresis: Electrophoregrams of the 88 wheat cultivars most commonly grown in the United States in 1979. *Cereal Chem.* 59(3); 1982; 181-8

1651 DANNO (G) and HOSENEY (RC). Effects of dough mixing and rheologically active compounds on relative viscosity of wheat proteins. *Cereal Chem.* 59(3); 1982; 196-8

1652 DANNO (G) and HOSENEY (RC). Effect of sodium chloride and sodium dodecyl sulphate on mixograph properties. *Cereal Chem.* 59(3); 1982; 202-4

1653 MEUSER (F), SUCKOW (P) and ABD-ELGAWAD (A). Characterisation of pentosan fractions from wheat. Part 2. Investigations about the gelation of pentosans and glycoproteins from the wheat cultivars, Diplomat and Maris Huntsman. *Getreide Mehl Brot.* 36(1); 1982; 1-5 (German)

The comparison of the fractionated glycoproteins from the wheat cultivars Diplomat and Maris Huntsman showed that the content of glycoprotein fraction 2, which is responsible for the gelation, is three times greater in the cultivar Diplomat than in Maris Huntsman. The best results were obtained with the glycoproteins from the cultivar Diplomat. VR

1654 DOUGLAS (SG). A rapid method for the determination of pentosans in wheat flour.. *Food Chem.* 7(2); 1981; 139-45

In this method, flour (approx. 5 mg) is added to 2 ml of water followed by 10 ml of a solution of glacial acetic acid, hydrochloric acid, phloroglucinol and glucose in a stoppered boiling tube, which is placed in a water bath for 25 minutes and the absorbance is measured at 552 nm and 510 nm. When excess sugars are present, the absorbance at 510 nm may be subtracted from 552 nm. KAR

1755 MacGREGOR (AW) and MATSUO (RR). Starch degradation in endosperms of barley and wheat kernels during initial stages of germination. *Cereal Chem.* 59(3); 1982; 210-16

During initial stages of germination; patterns of starch degradation in kernels of barley and durum wheat appeared to be similar as

assessed by scanning electron microscopy. Degradation started at the ventral crease edge of the endosperm-embryo junction and moved along this junction to the dorsal edge. This suggests that the site of initial α -amylase synthesis in germinating cereal grains is the embryo and not the aleurone layer. AA

- 1656 BODE (J) and SEIBEL (W). Acidification and dough handling: Definitions. Getreide Mehl Brot. 36(1); 1982; 11-2 (German)

An attempt has been made to define the various products for dough acidification (starter culture/sour dough - acidifying agent). Even the dough handling used in rye dough (indirect handling, direct handling, combined handling) have been described. In the case of wheat dough, indirect handling means the dough preparation with wheat sour dough or wheat preliminary dough. VR

- 1657 CHUNG (OK) and POMERANZ (Y). Recent research on wheat lipids. Baker's Dig. 55(5); 1981; 38-50,55

This review covers recent findings (5-6 years) on wheat and flour lipids which includes recent progress in wheat lipid methodology, wheat lipid composition and distribution, difference in wheat lipids obtained from different classes and varieties and changes in lipids and bread-making of stored wheat flours. KAR

MILLETS

SORGHUM

- 1658 CAGAMPANG (GB), GRIFFITH (JE) and KIRLEIS (AW). Modified adhesion test for measuring stickiness of sorghum porridges. Cereal Chem. 59(3); 1982; 234-5

- 1659 JAYAPRAGASAM (M), PARVATHI (K) and SELVARAJ (KV). Effect of some pre-harvest treatments on grain yield and protein content of sorghum. Madras Agric. J. 69(1); 1982; 6-10

Spraying of 15 or 20% solution of NaCl 48 hours before harvest, reduced the moisture content of sorghum grain by about 3%, whereas dusting carbaryl or chalk powder at the above stage reduced the moisture by 1 to 2% only. The grain yield and the protein content were not affected by the chemical desiccants tried. Harvesting Co 18 and Co 21 variety of sorghum on 90th, 95th or 100th day after sowing did not change the grain yield or protein content significantly. AA

MAIZE

- 1660 PEREZ (RA), TUIITE (J) and BAKER (K). Effect of moisture, temperature, and storage time on subsequent storability of shelled corn. Cereal Chem. 59(3); 1982; 205-9

Shelled corn of high quality was stored at 14.0, 15.5, and 18.0% moisture content (MC) for 7.0 or 7.5 months at postharvest Indianapolis temperatures (IT), starting October 15. After 2.5, 3.5, 5.5, and 7.0, or 7.5 months, aliquots were transferred to 84% rh or kept at their original moisture at 26 C for 21 days. The latter conditions were to represent transport to the southeastern United States. Mold spoilage was determined by examining kernels for visible molds, blue eye, kernel invasion, and fungal propagules. The corn was not invaded by fungi at 14.0 and 15.5% MC at IT for 7.5 months. Corn that was stored for 7.0 months at 18.0% MC was invaded by molds but was without visible mold on intact kernels. Visible mold appeared on some cracked pieces of corn. Although of high germination and free of detectable molds, corn stored for 7.5 months at 14.0 and 15.5% MC at IT developed more moldy kernels and fungi propagules after transfer to 26 C than did corn stored for

5.5 months or less. Corn stored at 18% MC for longer times at IT was more often invaded by fungi and also was more liable to spoilage at 26 C than was the corn stored for shorter periods or lower moistures at IT. AA

- 1661 BENNETT (GA), LAGODA (AA), SHOTWELL (OL) and HESSELTINE (CW). Utilization of zearalenone-contaminated corn for ethanol production. J. Am. Oil Chem. Soc. 58(11); 1981; 974-6

Zearalenone in the original corn was concentrated in the residual solids and solubles, which are generally used for animal feed. Treatment with formaldehyde significantly reduced the level of zearalenone in fermentation solids. Ammonium hydroxide was much less effective agent for toxin degradation. AA

PULSES

- 1662 TAJIRI (T). Suitable harvest time in reference to the changes of nutritional component during cultivation of bean sprouts. (Studies on cultivation and keeping quality of bean sprouts part IV). J. Jpn. Soc. Food Sci. Technol. 28(2); 1981; 79-84 (Japanese)

Bean sprouts were cultured by use of soyabean (*Glycine max*), mung bean (*Vigna radiata*), and adzuki bean (*Vigna angularis*) as materials, and suitable harvest time was estimated by considering such factors as degrees of growth, hardness of hypocotyl, and nutritional constituents. Cultivation was conducted under the optimum condition reported in the previous paper; that is, the seeds stored for 6 months at 0 C were immersed in 30 C water for 6 hours and held on sprouting beds which were sprayed 30 C water for 15 minutes every 4 hours. The three kinds of bean sprouts grew up rapidly during 4-5 days after planting (before immersion), after that the hypocotyl showed a slight decrease in diameter and became yellowish. Elongation, too, stopped for a while and the formation of lateral roots and foliage leaves was found 7 days after. Hardness of hypocotyl also increased during first 5 days, then gradually decreased. General tendency of the changes of vitamin C (reduced ascorbic acid), protein, and fat during cultivation was almost similar among the three beans. Vitamin C was synthesized during sprouting and its content increased through 5 days after planting, then slightly decreased. The greater part of vitamin C was found in hypocotyl. While the change of protein content differed between in hypocotyl and in cotyledon, its total content in the bean sprouts decreased rapidly during 4-5 days after planting. Fat content also showed a rapid decrease in a similar manner. The contents of protein and fat were markedly higher in soyabean sprouts than in mung bean and adzuki bean sprouts. By considering both external appearance and internal quality, it was concluded that 4-5 days after planting would be an optimum harvest time for three kinds of bean sprouts tested. AA

- 1663 NAGARDEOLEKAR (KK), INGLE (UM) and CHAVAN (JK). Effect of cooking on *in vitro* digestibility (IVPD) proteins of some legume seed dhals. Res. Bull. Marathwada Agric. Univ. 4(11); 1980; 142-4

- 1664 SHARIFF (G), PENZ (AM) and VOHRA (P). Nutritional improvement of beans (*Phaseolus vulgaris*) by autoclaving or water extraction for *Tribolium castaneum* larvae. Nutr. Rep. Int. 24(6); 1981; 1087-91

Larval weights of *Tribolium castaneum* fed diets containing 35% finely ground test beans, 5% brewer's yeast and 60% pearl corn starch from 6 to 16 days of age, reflected the nutritive value of the beans. Raw beans significantly depressed the growth of *Tribolium* larvae and caused heavy mortality. The autoclaved beans and water extracted beans significantly improved the growth of larvae, and caused no mortality. The autoclaved beans were, in general, significantly superior to water extracted beans. *T. castaneum* larvae can be used in nutritional evaluation of *Phaseolus vulgaris*. AA

GREEN PEA

- 1665 TANDON (DK), KALRA (SK) and CHADHA (KL). Chlorophyll degradation of green peas in solar dryers.
Indian J. Hortic. 38(3/4); 1981; 211-7

The chlorophyll content of green peas was reduced by more than half, when they were dried in two models of solar dryers, viz. D-I with indirect radiation, and D-II with direct radiation. A direct relationship was observed between chlorophyll loss and residual moisture. The D-II dryer could dry the peas in 7 hours as compared to 9 hours required for open air drying. The colour of the packed peas dried in a solar dryer was comparable to that of commercially dried peas, but the taste of peas dried in a solar dryer (either D-I or D-II) was inferior to that of peas dried in the open air. KMD

FABA BEAN

- 1666 D'AQUINO (M), ZAZA (G), CARNOVALE (E), GAETANI (S) and SPADONI (MA). Haemolytic toxic factors in faba beans (*Vicia faba*); Biological and chemical assays.
Nutr. Rep. Int. 24(6); 1981; 1297-305

The results have shown that (i) it was possible to detect with the biological model all the oxidative factors potentially haemolytic present in faba bean and in its derivatives, either free or bound as glucosides, (ii) the only toxic glucosides present in faba bean are vicine and convicine; (iii) in fresh beans, other free oxidative factors are present besides vicine and convicine. KAR

- 1667 MOSTAFA (MK) and MOSTAFA (TS). Effect of insect infestation on horse-bean seeds (*Vicia faba*).
Egypt. J. Food Sci. 9(1-2); 1981; 135-40

NAVY BEAN

- 1668 De FOUW (C), ZABIK (ME), UEBERSAX (MA), AGUILERA (JM) and LUSAS (E). Use of unheated and heat-treated navy bean hulls as a source of dietary fiber in spice-flavoured layer cakes.
Cereal Chem. 59(3); 1982; 229-30

OILSEEDS AND NUTS

- 1669 RAO (GVK). Inaugural address: 35th All India Convention of the Oil Technologists' Association of India.
J. Oil Technol. Assoc. India. 14(1); 1982; 8-16

In this review, the author has covered: (i) production, imports and supply of vegetable oil in India in recent years; (ii) the strategy for increasing the production of oilseeds by research, extension, development work; (iii) possibilities of increasing the yield of coconut and palm oil; and (iv) possibilities of increasing the availability of oil by technological processes such as solvent extraction of cottonseed, rice bran, mango kernels and oil cakes. Suggestions have been made on measures and policies to be adopted by the government. KMD

- 1670 CHHATRAPATI (AC). Prevention of Food Adulteration Act and Rules: Difficulties of the vegetable oil industry.
J. Oil Technol. Assoc. India. 14(1); 1982; 46

The author considers that the P.F.A. Act, in its present form, is unfair to producers of oilseeds and small oil-mill owners, because they do not have the technical competence or financial capacity to control the quality of the oilseeds and oils they buy and sell. Some lacunae in the existing act have been pointed out, and the need for more objective testing procedures has been stressed. KMD

- 1671 DEOSTHALE (YG). Trace element composition of common oilseeds. J. Am. Oil Chem. Soc. 58(11); 1981; 988-90
Nineteen varieties of groundnut (*Arachis hypogaea*), 8 of mustard (*Brassica nigra*), 9 of coconut (*Cocos nucifera*), and 6 each of sesame (*Sesamum indicum*) and safflower (*Carthamus tinctorius*) were analyzed for total ash and 9 mineral nutrients. Varietal differences were significant in magnitude for zinc in sesame; for manganese, molybdenum and chromium in mustard; for calcium, iron, manganese, copper, molybdenum and chromium in groundnut; for calcium, molybdenum and chromium in safflower; and for calcium, iron, copper and molybdenum in coconut. Sesame was the richest source of most of the inorganic nutrients. AA
- 1672 RHEE (KS) and ZIPRIN (YA). Oilseed protein ingredients as antioxidant for meat in food service. J. Food Prot. 44(4); 1981; 254-6
This study indicates that glandless cottonseed, peanut or soy protein ingredients may be incorporated in the gravy or sauce for precooked meat products to retard development of oxidative rancidity. AA
- 1673 NANDI (D), MONDAL (GC) and NANDI (B). Studies on deterioration of some oilseeds in storage. 3. Effects of different storage temperatures and relative humidities on seed moisture, germination and infection. Seed Sci. Technol. 10(1); 1982; 141-50
Seeds of two cultivars of sesame, two species of mustard and one linseed were collected after harvest, and six and 12 months later from private store-houses and stored under 80% and 90% RH at both 20 and 30 C. Effect of RH and temperature on seed moisture, germination and fungal invasion were studied at intervals of 21 days up to 84 days. In all cases, both seed moisture and fungal infection were higher at 90% RH and 20 C than in other treatments. A gradual decrease in infection by field fungi with concomitant increase by storage fungi, accompanied by a reduction in seed germination, occurred as storage progressed. Highest loss of germinability was noted at 90% RH and 30 C. AA
- SOYABEAN
- 1674 CROWTHER (A), WILSON (LA) and GLATZ (CE). Effects of processing on adsorption of off-flavours onto soy protein. J. Food Process. Eng. 4(2); 1981; 99-115
In the study, adsorption coefficients and heats of adsorption were compared for the adsorption of a number of volatile organics onto soy protein previously subjected to treatments involving different levels of temperature (100 and 121 C), moisture (29 and 40%) and shear. Heats of adsorption were unchanged, but changes in adsorption coefficients of the treated samples demonstrated a significant decrease in binding that can be attributed to protein denaturation. The response depended on the interaction of moisture and temperature effects. KAR
- 1675 KATO (H), DOI (Y), TSUGITA (T), KOSAI (K), KAMIYA (T) and KURATA (T). Changes in volatile flavour compounds of soyabeans during roasting. Food Chem. 7(2); 1981; 87-94
Raw soyabean was roasted at 200 C for 10, 20 and 30 minutes by steam distillation under reduced pressure. During roasting, major flavour components like n-hexanol, 1-octen-3-ol and n-hexanal decreased, but alkylated pyrazines, oxygenated furans, oxygenated pyrroles and phenols were formed or increased markedly. These results suggest that roast flavour masks the 'beany' flavour in soyabean. KAR
- 1676 NISHINO (R), OZAWA (Y), YASUDA (A) and SAKASAI (T). Oligosaccharides in soy sauce. J. Jpn. Soc. Starch Sci. 28(2); 1981; 125-31 (Japanese)
- 1677 MELTON (SL), MOYERS (RE) and JAYNES (JT). Storage effect on selected characteristics and lipids of defatted soy flours. J. Am. Oil Chem. Soc. 58(11); 1981; 959-66

Three defatted soy flours (fully toasted, white and enzyme active) 92 days after production date were stored at 23 C for periods of 0, 60, 120 and 180 days. At each storage period, lipoxygenase activity, thiobarbituric acid number (TBA), Nitrogen Solubility Index (NSI) and total lipid were determined in 5 replications of each flour. The lipid was separated into 3 fractions by silicic acid column chromatography and the fatty acid composition of each fraction was determined by GLC. Lipids in each fraction were identified by TLC procedures. Toasted flour had the greatest amount of total lipid and lowest TBA of the flours and no lipoxygenase activity. Enzyme active soy flour had the highest NSI and the greatest lipoxygenase activity. During storage, lipoxygenase activity of enzyme active flour and TBA and total lipid of each flour decreased. Percentages of lipids in fraction I, II or III were different among the soy flours, and the percentages of lipids in fractions I and II changed during storage. In each lipid fraction during storage, linoleic acid decreased in toasted and white flours but remained constant in enzyme active flour. Linoleic acid in any lipid fraction of enzyme active flour was lowest of the soy flours. AA

- 1678 ARECHAVALETA-MEDINA (F) and SNYDER (HE). Water imbibition by normal and hard soyabeans.

J. Am. Oil Chem. Soc. 58(11); 1981; 976-9

By observing the imbibition of dyed water, soyabeans were classified into damaged (break in seed coat), normal and hard beans. Hard soyabeans were unique in having a long, variable lag time before starting imbibition, but once water uptake was started, the rate was similar to that of normal beans. Soaking hard beans in methanol or ethanol for 24 hour at 20 C made them permeable to water. The cuticle was the most likely site of the water barrier in the seed coat of soyabeans. AA

- 1679 MINOR (HC) and PASCHAL (EH). Variation in storability of soyabeans under simulated tropical conditions.

Seed Sci. Technol. 10(1); 1982; 131-9

Seeds of 235 soyabean genotypes of potential tropical and subtropical adaptation were produced in a tropical environment in Puerto Rico and stored under simulated tropical conditions. Periodically, seeds were rapidly aged and germinated to assess the variation for storability existent among genotypes. Storability measured in this way reflects seed vigour more closely than a standard germination test. Germination percentage of most genotypes after rapid ageing diminished to near zero within eight weeks of the initiation of storage. A number of genotypes, however, exhibited superior storability. Observed correlation coefficients indicated a tendency for longer storage half-lives to be associated with higher initial germination percentage, higher percentage of hard seed, smaller seeds and earlier maturity. Only one genotype, 'Barchet', had a storage half-life longer than nine weeks. 'Barchet' had the highest hard seed percentage (60%) of all the genotypes tested. AA

- 1680 KLOCZKO (I) and RUTKOWSKI (A). Studies on usability of phytic acid determination for estimation of soyabean protein content in meat products. Acta Aliment. Polonica. 5(4); 1979; 331-36

Determination of phytic acid for analytical control of soyabean proteins in meat products was carried out. It has been found that the content of phytic phosphorus in soyabean preparation of isolate and concentrate types depend evidently on the content of proteins. Beef meat blends containing 2, 4 and 6% of soyabean isolates and concentrates were prepared and analysed. Phytic P determined in these blends was proportional to the amount of the substitute added. No correlation was found between total P and soyabean protein added. AA

- 1681 SAIO (K) and ANDO (Y). Identification of vegetable proteins in fabricated foods.

J. Jpn. Soc. Food Sci. Technol. 27(12); 1980; 604-9 (Japanese)

Using disc acrylamide gel electrophoresis, it is possible to detect the blending of more than 0.5% soyabean protein and more than 1% wheat

protein in processed foods. In meats and eggs, the subpeaks were near the main peaks of soyabean and wheat proteins so that they disturbed the identification. KAR

- 1682 ROY (DM) and SCHNEEMAN (BO). Effect of soy protein, casein and trypsin inhibitor on cholesterol, bile acids and pancreatic enzymes in mice. J. Nutr. 111(5); 1981; 878-85

Soyabean trypsin inhibitor does not seem to affect cholesterol metabolism, though it greatly affects pancreatic secretion. On the other hand, soy protein has a marked effect on bile acid and cholesterol metabolism, which may be a function of protein quality. KAR

- 1683 NODA (F). Effect of metal contents in brewing water on colour of soy sauce. J. Ferment. Technol. 58(5); 1980; 449-56

Soy sauce was prepared using brewing water with or without metal salts (FeCl_2 , FeCl_3 , MnCl_2) in concentrations of 50 ppm. A significant effect of metals on the increase in colour of brewed soy sauce was not observed. KAR

SUNFLOWER

- 1684 MORRISON (WH) III, AKIN (DE) and ROBERTSON (JA). Open pollinated and hybrid sunflower seed structures that may affect processing for oil. J. Am. Oil Chem. Soc. 58(11); 1981; 969-72

Oil and wax contents of confectionery (non-oil) and oilseed, open-pollinated and hybrid sunflower seed and their hulls, testae, and kernels were determined. Wax content inversely correlated with hull content, and the degree to which the seeds were compressed correlated with hull thickness. Light and electron microscopy showed increased connective tissue in the hybrid seed. This combination of higher wax content in the dehulled hybrids and increased connective tissue between hull and kernel could explain the reports of high wax content of the oil from newly developed hybrid seed. AA

- 1685 ROBERTSON (JA) and WINDHAM (WR). Comparative study of methods of determining oil content of sunflower seed. J. Am. Oil Chem. Soc. 58(11); 1981; 993-6

An extraction-gravimetric method (AOCS Official Method Ai 3-75) was compared with 2 instrumental techniques near-infrared reflectance (NIR) spectroscopy and wide-line nuclear magnetic resonance (NMR), for the determination of the oil content of oilseed-type hybrid sunflower seed. The NMR method was more precise and reproducible than the other 2 methods. Although the NIR mean oil contents were not significantly different from the means of the other 2 methods, the coefficient of variations for all samples were consistently higher for the NIR analyses than for the AOCS and NMR analyses. AA

- 1686 CHANNAL (HT) and BALAKRISHNA RAO (K). Effect of sulphur, iron and zinc on oil and protein contents of sunflower (*Helianthus annuus* L.). Res. Bull. Marathwada Agric. Univ. 4(12); 1980; 160-62

- 1687 HUANG (AS), HSIEH (OAL), HUANG (CL) and CHANG (SS). A comparison of the stability of sunflower oil and corn oil. J. Am. Oil Chem. Soc. 58(11); 1981; 997-1001

COCONUT

- 1688 SUSAMMA PHILIP and MENON (MR). Microorganisms associated with the deterioration of copra. Madras Agric. J. 68(10); 1981; 686-7

Copra from 4 oil mills was collected every month over a period of 12 months and tested for microflora by standard procedures. Pathogenicity

was confirmed by artificial inoculations and the identity confirmed by C.M.I., London. Of the fungi and bacteria recorded, new reports on copra were: *Rhizopus stolonifer*, *R. oryzae*, *Mucor hiemalis*, *Penicillium citrinum*, *Curvularia senegalensis*, *Cochliobolus lunatus*, *Paecilomyces lilacinus*, *Aspergillus oryzae*, *A. fumigatus*, *Bacillus subtilis*, *Enterobacter aerogenes*, *Pseudomonas fluorescens* and *Sarcina lutea*. Actinomycetes did not show a definite pattern of occurrence. Only *Streptococcus* sp. was noticed, but it was non-pathogenic. MVG

HAZEL NUT

- 1689 GARGANO (A), MAGRO (A) and MANZO (P). Chemical characteristics of the fruits of some principal hazel-nut cultivars. 2. Ind. Aliment. 21(1); 1982; 15-6 (Italian)
Shelled and unshelled hazel-nuts, belonging to 9 different cultivars, were preserved under the same conditions for 9 months after harvest, and the free acidity (expressed as oleic acid), the peroxide value; the refractive index and refractometric degree at 25 C were measured. The amino acid composition has also been determined. There was no substantial hydrolysis of the triglycerides into free fatty acids and glycerine during the storage period. The change in peroxide value was small, and especially so in the whole nuts (i.e. with shell). Thus, the shell provides good protection against oxidation of the double bonds of unsaturated fatty acids by air. KMD

TUBERS AND VEGETABLES

- 1690 MOON (NJ). Development of microbial populations in fermented wastes from frozen vegetable processing. J. Food Prot. 44(4); 1981; 288-93
- 1691 ANON. Dehydrated vegetables: Careful marketing required. Profodcil Bull. 17(1); 1982; 10-13
Major importing countries of dehydrated vegetables and the share of developing countries are outlined. The different segments of the food industry that utilise the dehydrated vegetables are also briefly reviewed. A survey report of the product preferences for dehydrated vegetables in eight European countries is given. Importance of noting preferential tariff consideration for developing countries has also been pointed out. MVG
- 1692 MENCARELLI (F). Influence of water composition on the quality of canned vegetables. Ind. Aliment. 21(1); 1982; 25-6 (Italian)
A brief review. KMD
- 1693 KUBOTA (K), FUJIMOTO (M), SUZUKI (K) and TAKASAKI (K) and HOSAKA (H). A study on the thermal diffusivity of spherical root vegetables. J. Jpn. Soc. Food Sci. Technol. 28(2); 1981; 68-73 (Japanese)
In previous papers, we have studied the cooking-rate of root vegetable slices. In order to design various cooking apparatuses, it is necessary to measure the thermal diffusivity which must be used for cooking of large root vegetables. In this paper, we studied the thermal diffusivity of the root vegetables curved spherically. The values of thermal diffusivity of potato, sweet potato, carrot and radish were obtained to be 0.097, 0.101, 0.103 and 0.101 cm²/minute, respectively. AA
- 1694 OKA (H) and UEOKA (Y). Studies on manufacturing conditions of drying foods by frying under reduced pressure. J. Jpn. Soc. Food Sci. Technol. 28(2); 1981; 94-9 (Japanese)
An ordinary frying process under atmospheric pressure brought about brownish discolouration of dehydrated potato and coloured vegetable

and fruits cut into thin slices. The authors found out that the discoloration was prevented when frying was carried out under reduced pressure and suggested that the maintenance of pressure at about 60 mm Hg would be suitable for the treatment at 100 C for ten minutes. AA

ONION

- 1695 MAZZA (G), LeMAGUER (M) and HADZIYEV (D). Headspace sampling procedures for onion (*Allium cepa* L.) aroma assessment. Can. Inst. Food Sci. Technol. J. 13(2); 1980; 87-96

In order to study the effect of nutrition, irrigation, variety and dehydration on onion flavour strength, analytical procedures based on headspace sampling of volatiles were evaluated. A procedure using a porous polymer, Tenax-GC, to concentrate the headspace volatiles by trapping followed by gas chromatography with or without a liquid phase column was found to be most suitable. Reproducibility of the results required standardization of the sampling procedure. Of major importance were the extent of sample disintegration, incubation temperature, timing and the rehydration ratio of dehydrated samples. Quantitative data for the volatiles of fresh onion slices were also provided and compared with those dehydrated by a pilot-scale process. AA

CARR OT

- 1696 BAARDSETH (P) and SLINDE (E). Peroxidase and catalase activity in carrot. Food Chem. 7(2); 1981; 147-50

Peroxidase and catalase activities were determined in one variety of carrot grown at five different geographical locations. No correlation was found between weight and protein content, weight or protein and enzyme activity or between peroxidase and catalase activity. KAR

POTATO

- 1697 NUSS (J) and HADZIYEV (D). Effect of heat on molecular weight and charge of potato sap proteins. Can. Inst. Food Sci. Technol. J. 13(2); 1980; 80-86

- 1698 DIXON (WL), FRANKS (F) and REES (T). Cold-lability of phosphofructokinase from potato tubers. Phytochemistry. 20(5); 1981; 969-72

- 1699 PALASINSKI (M). On the phosphoric acid in potato starch. Starch. 32(12); 1980; 405-8 (German)

Potato starch contains chemically linked ortho-phosphoric acid (30 to 175 mg /P). Ion exchange and self hydrolysis are the most important physico-chemical properties of potato starch effected by phosphoric acid. Salts of pure esters of amylophosphoric acid are produced by ion exchange. The self hydrolysis consists of two processes; the splitting of the glucosidic linkages and the splitting of the ester linkage between phosphoric acid and glucose unit. The process of self hydrolysis can be used in the industry for the production of degraded starch products with different technical properties. KMD

- 1700 GLADKOWSKI (J), SROCZYNSKI (A) and BIELARZ (H). Energy demand for extraction and raffination step in production of potato starch. Starch. 32(12); 1980; 415-20 (German)

CASSAVA

- 1701 OKIGBO (BN). Nutritional implications of projects giving high priority to the production of staples of low nutritive quality: The case for cassava (*Manihot esculenta*, Crantz) in the humid tropics of West Africa. Food Nutr. Bull. 2(4); 1980; 1-10

KARAUNDA

- 1702 PRABAHARAN (T) and JOSE (AI). Standardisation of technique for the preparation of candy from Kelakhai (*Carissa caranda*). Madras Agric. J. 68(10); 1981; 683

For preparing candy, Kelakhai was kept immersed in brine (15%) containing sodium metabisulphite (equivalent of 60 ppm of SO₂) for 2 days to bleach colour, washed with water, deseeded, and cooked in boiling water till soft (but not too soft), water was changed three or four times. The softened fruits were immersed overnight in a sugar syrup (40 Brix) containing the dye erythrosine BS ($\times$ 0.2 g/kg) after which the syrup was drained off. The concentration of the syrup was increased by 10 Brix by adding sugar and boiling, and the hot syrup was added to the fruits and kept overnight. The Brix was thus raised to 70-72. Excess syrup was drained off. The candy was air dried and packed in polythene bags for use in bakeries as an ingredient of cakes and fruit buns. KAR

TOMATO

- 1703 El-SHERBINY (GA) and RIZK (SS). Changes in tomato components due to thermal treatment and storage. Egypt. J. Food Sci. 9(1-2); 1981; 113-20
- 1704 DRAUGHON (FA), ELAHI (M) and McCARTY (IE). Microbial spoilage of Mexican style suaces. J. Food Prot. 44(4); 1981; 284-87

FRUITS

- 1705 ANON. Europe: Key export openings for certain fresh fruits and vegetables. Profodcil Bull. 17(1); 1982; 14-20
Trends in the increase of import of fresh tropical fruits and off-season vegetables from developing countries to Europe have been highlighted. The market potential for pineapples, avocados, mangoes, coconuts, passion fruit, chillies, asparagus, aubergines and courgettes, green beans, capricums, melons and strawberries have been indicated. The list of developing countries and the principal products they export are given. MVG
- 1706 ANON. Sweden. Brief market survey on preserved fruits. Profodcil. Bull. 17(1); 1982; 21-3
The marketable products to Sweden were dried and exotic fruits, jams and marmalades etc. and canned fruits. The countries of origin and the channels for exporting these products to Sweden are briefly mentioned. MVG
- 1707 BERRY (RE). Tropical fruits and vegetables as potential protein sources. Food Technol. 35(11); 1981; 45-9
Deals with the protein content of tropical fruits and the quality of these fruit proteins. The protein production from leafy vegetables and their potential has also been covered. KAR

DATE

- 1708 BENJAMIN (ND), TONELLI (KC) and ALI (NM). Date pclyphenol oxidase: Partial purification and characterization. Egypt. J. Food Sci. 9(1-2); 1981; 121-33

RASPBERRY

- 1709 HONKANEN (E), PYYSALO (T) and HIRVI (T). The aroma of Finnish wild raspberries, *Rubus ideaus*.
Z. Lebensmittel-Unters. Forsch. 171(3); 1980; 180-2

A total of 75 components were identified, corresponding to about 64 ppm of raspberry oil in the press juice. More than 40 compounds not reported previously as raspberry volatiles were detected. These included 5 methyl-4-hydroxy-3(2H) furanone, 2,5 dimethyl-4-hydroxy 3(2H) furanone, 2,5 dimethyl 4-methoxy-3(2H) furanone and 11 terpenes. Two of the identified esters, ethyl 5 hydroxyoctanoate and ethyl 5 hydroxydecanoate, have not been previously identified in natural products. These esters are very unstable, forming the corresponding δ -lactones during processing of the berries. AA

CITRUS

- 1710 OHTA (H), WATANABE (A), IINO (K) and KIMURA (S). A study on developing solvents for thin layer chromatographic separation of major limonoids in seeds of *Citrus Natsudaïdai*.
J. Jpn. Soc. Food Sci. Technol. 28(2); 1981; 91-3 (Japanese)

Eighteen kinds of developing solvents for the thin layer chromatographic separation of limonoids contained in seeds of *Citrus Natsudaïdai* on a silica gel G plate were examined. It was demonstrated that the crude limonoids extracted from the seed were separated into six spots with nine kinds of solvents; chloroform-acetone (9:1), ethyl acetate-*n*-hexane (9:1), ethyl acetate-ethyl ether-*n*-hexane (5:4:1), methylenechloride-ethyl ether-acetic acid (185:15:2), benzene-chloroform-ethyl ether-acetic acid (8.5:8.5:3:1 and 13:13:13:1) and chloroform-ethyl ether-acetic acid (130:65:2, 26:13:1 and 30:10:1). Both benzene-chloroform-ethyl ether-acetic acid (13:13:13:1) and chloroform-ethyl ether-acetic acid (130:65:2) systems were better than any other solvents. AA

LEMON

- 1711 JOSAN (JS), SHARMA (JN) and CHCHAN (GS). Effect of post-harvest application of ethrel on degreening of Italian round lemon.
Indian J. Hortic. 38(3/4); 1981; 178-83

Italian round lemons (*C. limon*) were dipped for one minute in 0, 1000, 1500, 2000 and 2500 ppm solutions of ethrel, dried and then packed either in newspaper or in perforated polythene sheets of 300 guage. The maximum number of yellow fruits was obtained by dipping the fruits in 2500 ppm ethrel and packing them in polythene. Fruits kept in polythene wrappings retained their firmness and usual freshness, and suffered the minimum loss in weight. KMD

ORANGE

- 1712 El-SHERBINY (GA) and RIZK (SS). Orange concentrates prepared by different techniques. 2. Storage stability.
Egypt. J. Food Sci. 9(1-2); 1981; 93-101

Different orange concentrates were stored for 9 months at -10 to test for stability of the products. No loss could be detected in total sugars, However, values for reducing sugars increased, while the corresponding values for non-reducing sugars decreased. Titratable acidity

slightly increased, but ascorbic acid decreased considerably, while amino nitrogen slightly decreased. Of the minor constituents, limonin and volatile oil decreased, while oxygenated terpenes and aldehydes increased. Sensory evaluation revealed that both colour and flavour slightly decreased in spite of nitrogen packing and low storage temperature. Variabilities among different treatments were evaluated and compared. AA

MANGO

- 1713 ANON. Mango: A survey on production and marketing. Profodcil. Bull. 16(4); 1982; 3-32

World production of mangoes; variety; season and chemical composition of Indian mangoes; and export of mangoes to various countries from India and the major importers of Indian mangoes are given. Guidelines for harvesting, maturity, grading and transport and the cold storage facilities needed are also covered. MVG

- 1714 CHANDRAMOHAN (N), MOHANASUNDARAM (M) and BALASUBRAMANIAN (M). A note on chemical control of mango nut weevil, *Sternochetus mangiferae* (Fabricius) synchronizing with the oviposition period in Tamil Nadu. Indian J. Hortic. 38(3/4); 1981; 280-81

The S. Indian mango var., "Neelum", usually has an insect (the mango-nut weevil) inside its seed (or nut). Though the presence of the weevil does not pose any danger to the consumer of the mango, it makes the fruit unattractive. Hence, Neelum trees were sprayed with 14 types of insecticides and two types of oils during the peak ovipositional period (i.e. 2nd week of March) to control this pest. Fenvalerate (0.02 or 0.03%), FMC-35001 (0-1%), and carbaryl (0.2%) reduced the incidence of this pest to nil. The incidence in the untreated control plot was 47.22%. KMD

APRICOT

- 1715 HENNING (W) and HERRMANN (K). Flavonol glycosides of apricots (*Prunus armeniaca* L.) and peaches (*Prunus persica* Batsch). 13. Phenolics of fruits. Z. Lebensmittel-Unters. Forsch. 171(3); 1980; 183-8 (German)

APPLE

- 1716 LEFLUFFY (MJ). The design of a prototype apple harvester. J. Agric. Eng. Res. 27(1); 1982; 51-60

Previous methods of harvesting apples mechanically are reviewed briefly. A novel method of removing apples by a combing technique is then discussed. The design of a prototype harvester capable of harvesting dessert quality fruit continuously from hedgerow type trees, utilizing this combing technique is described in detail. AA

- 1717 CZYZYCKI (A), MASIOR (S), POGORZELSKI (E), LUKAWSKAPIETRZAK (Z), ADAMOW-PIASZCZYNSKA (M) and BURY (S). Stabilization of apple wines containing gelatinized starch and dextrin. Acta Aliment. Polonica. 5(4); 1979; 323-30

A method of stabilization of apple wines containing gelatinized starch and dextrin has been developed. The method depends on the hydrolysis of these ingredients with amylolytic enzymes contained in "Pektopol P" at the storage cellar temperature of approximately 15 C for one week, followed by the inactivation of introduced enzymes by short pasteurisation at 87-90 C. AA

- 1718 WILLS (RBH). Incorporation of (^{14}C) acetate into apples in relation to development of storage breakdown. Phytochemistry. 20(6); 1981; 1253-4

(2-¹⁴C) Acetate was injected into the core of Jonathan apples that had been stored at -1 under high and low relative humidity conditions to induce a difference in susceptibility of the fruit to develop storage breakdown. Incorporation of (¹⁴C) into the total non-volatile compounds in the flesh tissue and the neutral lipids was initially greater in the fruit that was more susceptible to breakdown, but after 25 days the amount of (¹⁴C) in the fruit of lower susceptibility had increased to a similar level. Incorporation of (¹⁴C) into the semi-polar lipids was initially similar in about both treatments, but became greater after 15 days in the fruit that was more susceptible to breakdown, the difference was maintained during the rest of the storage period. No marked differences in incorporation into polar lipids was found throughout storage. AA

PAPAYA

- 1719 DHAWALIKAR (HS) and PANDIT (MW). Stability studies on papain under varying time and temperature of storage. Res. Ind. 27(1); 1982; 22-6

Papain concentrate was stored at room temperature (25 C) and at 37 C and its milk-clotting activity was assessed after 48 hours of storage. Results show that the papain-concentrate loses about 16% of its activity within the first 7 weeks without further loss of activity at least for about 14 weeks. AA

AMLA

- 1720 SADHANA TANEJA, PARMAR (MSS), WILLIAMSON (D) and JAIN (BL). Change in ascorbic content of amla fruit (*Embllica officinalis*) after fungal infection. Sci. Cult. 48(6); 1982; 225-6

Fresh amla fruits were inoculated with *Penicillium digitatum*, *Aspergillus niger* and *Fusarium moniliforme* and incubated at 25 ± 1 C under 12 hours each of artificial light and darkness. They were analysed for free ascorbic contents initially after 42 hours of incubation and thereafter every alternate day. Results showed that ascorbic acid contents of both healthy and infected fruits decreased with incubation period, but the rate of decrease in healthy fruits was much lower compared to infected fruit. MVG

PHALSA

- 1721 HARMAIL SINGH and RANJIT SINGH. Effect of plant growth regulators and manuring on the fruit quality of phalsa (*Grewia subinaequalis*). Indian J. Hort. 38(3/4); 1981; 157-61

Giberellic acid (60 ppm), 2,4,5-T (5 ppm), or 2,4-D (2.5 ppm), used alone or in combination increased the size of phalsa berries at the start of the harvesting period, but the size decreased as the harvesting period advanced. Heavy fertilization has no effect on fruit size. None of the treatments employed had any effect on the chemical composition of the fruit. KMD

SUGAR, STARCH AND CONFECTIONERY

- 1722 KAINUMA (K). Preparation, fractionation and analysis of maltooligosaccharides. J. Jpn. Soc. Starch. Sci. 28(2); 1981; 92-9 (Japanese)

- 1723 MATSUDA (K). Structural studies on oligosaccharides. J. Jpn. Soc. Starch. Sci. 28(2); 1981; 100-108 (Japanese)

- 1724 NUNOKAWA (Y). Oligosaccharides in sake.
J. Jpn. Soc. Starch. Sci. 28(2); 1981; 109-17 (Japanese)
- 1725 KITAHATA (S), YOSHIKAWA (S), OKADA (S), TAKEUCHI (K), IMAI (S), NISIZAWA (T) and ARAYA (S). Dental caries and oligosaccharides.
J. Jpn. Soc. Starch. Sci. 28(2); 1981; 142-9 (Japanese)
- 1726 SAKAI (S). Production and usage of maltose.
J. Jpn. Soc. Starch. Sci. 28(2); 1981; 72-8 (Japanese)
A new process for maltose and its properties are discussed. High purity (70-100%) maltose is producible at low cost by hydrolyzing liquified starch slurry with α -amylase, free β -amylase and a combination of debranching enzymes, then, further hydrolyzing maltotriose, formed in the hydrolysate, with an enzyme derived from higher plants, molds, or bacteria and purifying followed by crystallization. AA
- 1727 HIDAKA (H) and KONO (T). On various methods of maltose production.
J. Jpn. Soc. Starch. Sci. 28(2); 1981; 79-86 (Japanese)
Maltose production method or procedure can be divided largely into two parts; one is saccharification process where hydrolysis of starch to maltose utilizing amylase and the rest is separation or purification process to give high purified maltose more than 95% maltose content utilizing several purification methods such as adsorption and separation, precipitation by organic solvent, separation by membranes and crystallization. Authors discovered α -amylase from *Streptomyces* which can produce maltose more than 75% from starch, but it can be said that combination of saccharification and purification is necessary to produce high purity maltose on an industrial scale. Feasibility of all the maltose production methods are discussed. AA
- 1728 KOBAYASHI (S) and KAINUMA (K). Cyclodextrins - Production and utilization of a α -cyclodextrin.
J. Jpn. Soc. Starch. Sci. 28(2); 1981; 132-41 (Japanese)
- 1729 EBERSTEIN (K), HOPCKE (R), KONIECZNY-JANDA (G) and STUTE (R). DSC investigations of starches. Part 1. Feasibility of thermoanalytical methods to characterize starches.
Starch. 32(12); 1980; 397-404 (German)
The results on the application of differential scanning calorimetry (DSC) upon the gelatinization and reorganization of starch polymers (retrogradation) are discussed. Considerable emphasis was laid on optimization of the analytical method. The gelatinization temperatures determined from DSC curves, agree well with microscopically determined data. DSC proved useful even in the case of investigations with limited water content. KMD
- 1730 ZEPPENFELD (K). Plant results with siphon centrifuges for starch de-watering.
Starch. 32(12); 1980; 411-5 (German)
- 1731 OWUSU-ANSAH (J), VAN DE VOORT (FR) and STANLEY (DW). Determination of starch gelatinization by X-ray diffractometry.
Cereal Chem. 59(3); 1982; 167-71
The potential of X-ray diffractometry for quantitative determination of gelatinization of starch was evaluated. The method, which used a "built-in" internal standard approach, had a total coefficient of variation of 99.87%. The diffractometry method also correlated well with a standard chemical method. Both procedures showed that critical moisture contents of 45-47% for maize and 55% for pea were necessary for complete gelatinization of these starches. Results from scanning electron microscopy ran parallel to the chemical and X-ray data, indicating that both methods measure physical changes taking place during gelatinization. AA
- 1732 UEDA (S) and SAHA (BC). Inhibition of raw starch digestion by one glucoamylase preparation from black *Aspergillus* at high enzyme concentration.
Starch. 32(12); 1980; 420-3

Raw starch digestion by a glucoamylase preparation from black *Aspergillus* was inhibited at relatively high concentration of enzyme. The glucoamylase preparation was then separated into glucoamylase I and II by DEAE cellulose chromatography. The phenomenon of inhibition was present in glucoamylase I only. Glucoamylase I had a high debranching activity and was very active in raw starch digestion at low enzyme concentration. AA

CONFECTIONERY

- 1733 ANON. UK: Confectionery production and consumption. Manuf. Confect. 61(9); 1981; 40-41,46,48-9
- 1734 CONKLIN (G). Worldwide research needs. Manuf. Confect. 61(9); 1981; 78-80
- 1735 SCHUTZE (K). Confectionery and health: An international comparison. Manuf. Confect. 61(9); 1981; 82-6
- 1736 ANON. Report on Interpack 81-4-Machines for the preparation of cocoa, chocolate, chewing gum, sweets, biscuits. Ind. Aliment. 21(1); 1982; 47-56 (Italian)
- 1737 GREELEY (H). Cocoa powder: An overview of supply and consumption in the U.S. market. Manuf. Confect. 61(9); 1981; 52-4

CANDY

- 1738 ANON. Candy merchandising in the convenience store. Manuf. Confect. 61(9); 1981; 33,35-6

BAKERY PRODUCTS

- 1739 JOHNSON (CC). Control panels for automated bakery equipment: Recent developments in application and design. Baker's Dig. 55(5); 1981; 52-5,97
The advanced control technology described here includes electro-mechanical components and solid state components including photoelectric eyes, proximity switches, rotary limit switches and variable speed drives. KAR
- 1740 WHITE (DW). Bulk pneumatic handling of flour and other bakery ingredients. Baker's Dig. 55(5); 1981; 62-4,66-7
- 1741 DIACHUK (VR), HAMILTON (E), SAVCHUK (N) and JACKEL (SS). Bakery flour control using near infra red reflectance analysis. Baker's Dig. 55(5); 1981; 72-5,102
The results reported point out that the Technicon 300B near infra red reflectance analyzer, equipped with universal calibration factors is capable of analysing baker's hard wheat patent flour for moisture, ash and protein with high degree of accuracy. KAR
- 1742 FRENCH (FD) and FISH (AR). High speed mechanical dough development. Baker's Dig. 55(5); 1981; 80-82
- 1743 FONSECA (G), RUGGIERI (G) and RUGGERI (P). Content of oligoelements in some bakery products. Ind. Aliment. 21(1); 1982; 17-9 (Italian)
The lead, cadmium, chromium, copper, and zinc contents in bakery

products have been determined. The lead and cadmium concentrations were found to be within the limits proposed as acceptable by FAO/WHO. KMD

- 1744 DEGLI ANGELI (A). Water activity in bakery products.
Ind. Aliment. 21(1); 1982; 20-25 (Italian)

The author has reported earlier (see Dec.1981 issue) the results of his studies on the water activity of baked confectionery goods. This paper is a brief review of some other studies and considerations. KMD

- 1745 KING (BD). Microbial inhibition in bakery products: A review.
Baker's Dig. 55(5); 1981; 8-12

The review covers types of microbial spoilage; preservative and their mode of action. Each antimicrobial additive is dealt separately. KAR

- 1746 SPICHER (G). New aspects of the biology of sour dough fermentation.
(German)

Getreide Mehl Brot. 36(1); 1982; 12-6

The sour dough starters, used in sour dough fermentation contain lactic acid bacteria and yeasts of different kinds. The lactic acid bacteria, described as *Lactobacillus brevis* var. *Lindneri*, are in a position to ensure sufficient acidification of the sour dough. Considering the different acidification properties of the lactic acid bacteria of sour dough and the different composition of the microflora of the acid dough starters, any statement on the influence of the parameter of sour dough development on the acidification may hold good only for that particular starter culture. VR

- 1747 TANAKA (Y). Freezing injury of Baker's yeast in frozen dough.
J. Jpn. Soc. Food Sci. Technol. 28(2); 1981; 100-101 (Japanese)

BREAD

- 1748 LOEB (RV). Modern production of hearth breads.
Baker's Dig. 55(5); 1981; 56-58,60

After discussing the traditional production methods, the author describes automated production technology which includes ingredients and processing, and dough elongation process in the production of modern hearth breads. KAR

- 1749 RANHOTRA (GS). Wheat and bread: Available nutrients and dietary role.
Baker's Digest. 55(5); 1981; 32-6

The nutrients supplied by bread and flour has been reviewed along with their dietary role. KAR

- 1750 TANGKONGCHITR (U), SEIB (PA) and HOSENEY (RC). Phytic acid. III. Two barriers to the loss of phytate during breadmaking.
Cereal Chem. 59(3); 1982; 216-21

- 1751 STEPHAN (H). Sour dough handling and bread quality.
Getreide Mehl Brot. 36(1); 1982; 16-20 (German)

There are different types of sour dough handling. They meet the most varied requirements, above all with regard to periodic processing tolerance. The guidelines for various three-, two-, and single step handlings are discussed and recommendations for corrections have been given. VR

- 1752 SALOVAARA (H). Potassium and magnesium chloride as a substitute of sodium chloride in rye bread. A sensory evaluation.
Getreide Mehl Brot. 36(1); 1982; 20-22 (German)

A high sodium consumption causes high blood pressure. A rye bread with potassium or magnesium as a substitute of sodium chloride (table salt) was made (5,10,20 and 40%). In the sensory evaluation, it was ascertained that the sodium chloride content in this bread can be reduced

by 25% without changing the taste. For this purpose, potassium salts proved more suitable than magnesium salts. VR

- 1753 KULP (K) and LORENZ (K). Starch functionality in white pan breads: New developments.
Baker's Dig. 55(5); 1981; 24-28,36

The paper concentrates on functional aspects related to (a) surface properties of granules, (b) variation in gelatinization temperature and (c) granule order. KAR

- 1754 SEIBEL (W). Results of the 23rd quality test and evaluation of wheat breads and other baked goods.
Getreide Mehl Brot. 36(1); 1982; 23-7 (German)

SPAGHETTI

- 1755 KUBOTA (K), FUJIMOTO (M), SUZUKI (K) and HOSAKA (H). Studies on the cooking-rate equations of spaghetti and Hi Yamugi.
J. Jpn. Soc. Food Sci. Technol. 27(8); 1980; 381-7 (Japanese)

The simple empirical rate equations of spaghetti and hiyamugi were expressed as:

$$dx/d\Theta = k_0(1-x)^n, \quad x = (w-w_0)/(w_e-w_0), \quad n = 2$$

For Spaghetti: $k^n = 5.11 \times 10^3 \exp (-8.72 \times 10^3 / R_g T)$, where x = cooking ratio (-); Θ : cooking time (min.); w , w_e , w_0 = cooking intermediate initial and equilibrium weights (g), T = cooking temperature ($^{\circ}\text{K}$) and R_0 = gas constant (cal/g-mol. $^{\circ}\text{K}$). KAR

- 1756 WYLAND (AR) and D'APPOLONIA (BL). Influence of drying temperature and farina blending on spaghetti quality.
Cereal Chem. 59(3); 1982; 199-201

- 1757 MATSUO (RR), DEXTER (JE), KOSMOLAK (FG) and LEISLE (D). Statistical evaluation of tests for assessing spaghetti making quality of durum wheat.
Cereal Chem. 59(3); 1982; 222-8

Thirty durum wheat cultivars grown at two locations for two years were subjected to detailed physical, chemical, and rheological tests to ascertain which test or group of tests best predicted spaghetti cooking quality. Data were pooled, and by analysis of variance, the influence of location, year, variety, and interactions on each quality test were determined. Simple correlation coefficients among all the tests were calculated to determine the interrelationship of the tests. Tests for gluten quality, farinograph bandwidth, and mixograph mixing time were significantly correlated to cooking quality. Stepwise regression analysis showed that semolina protein, specific absorption, sodium dodecyl sulphate sedimentation volume, and farinograph bandwidth are the best predictors of cooking quality. Specific absorbance appears to be the most useful test in which only one or two variables were used to predict cooking quality. Although spaghetti colour values correlate to cooking quality characteristics, components or reactions causing brownness in spaghetti appear to be more important. AA

MILK AND DAIRY PRODUCTS

MILK

- 1758 MUDGETT (RE). Performance models for continuous dielectric pasteurization of milk.
J. Food Process. Eng. 3(4); 1981; 217-28

Electrical properties of the milk were determined from the Hosted-Debye models for aqueous ionic solutions. Heating characteristics of an

experimental exchanger agreed closely with the predicted values for various flow rates and voltage gradients at temperature of interest in pasteurizations of biological fluids. Such models could be employed in the development of electrical pasteurization or sterilization processes for a variety of food products. Electrical heating processes would reduce thermal denaturation of heat labile food constituents and would result in higher thermal death rates for vegetative microbial contaminants and the process temperatures and holding times practised. KAR

- 1759 KIRST (E). Lipolytic processes in milk and dairy products. Investigations about the influence of cooling on the structure of the milk fat. *Lebensmittel-industrie*. 27(10); 1980; 464-8 (German)
- Sufficient refrigeration is necessary in order to limit the propagation of germs in milk. But refrigeration causes lipolytic changes and has consequences on the quality of the milk and dairy products. The change of "free" fat, free fatty acids and the total "free" fat were analysed in order to evaluate the influence of refrigeration on the milk fat. The results show that less lipolytic changes are effected by flow refrigeration than by storage refrigeration. Furthermore, it was stated that the lipolysis increases during reheating and repeated refrigeration. Lipolysis by refrigeration in vacuum is 10% less than that under normal pressure. AA
- 1760 ANON. Exploring cow's milk and soy protein sensitivity in human infants. *Nutr. Rev.* 39(8); 1981; 305-7
- 1761 MARSHALL (RT) and SHELLEY (DS). Comparisons of tests of milk samples taken conventionally and with an automatic in-line sampler. *J. Food Prot.* 44(4); 1981; 257-62
- 1762 ROETMAN (K). Methods for the quantitative determination of crystalline lactose in milk products. *Neth. Milk Dairy J.* 36(1); 1982; 1-52
- A quick and simple method for the quantitative determination of crystalline lactose in milk products was developed. It was based on the determination of refractive indices. Three methods, based on refractive index, separation, and polarimetric determination of the isomer ratio respectively, were evaluated for their suitability to examine concentrated whey. The same methods, together with those based on gas chromatographic determination of the isomer ratio, water determinations (drying versus Karl Fischer titration) and differential thermal analysis were evaluated for their suitability to test dried whey and dried skim milk. The criteria handled were accuracy, ease of operation and possible limitations for application. VR
- 1763 DAEMEN (ALH). The estimation of the mean particle density, the vacuole volume and the porosity of spray dried porous powders. *Neth. Milk Dairy J.* 36(1); 1982; 53-64
- By combining the liquid paraffin displacement method with the air Pyknometer method, a method of assessing the particle porosity of porous powders has been obtained. The difference between the vacuole volume derived from measurements with the liquid paraffin displacement method and the vacuole volume derived from measurements with the air pyknometer is considered to be a good measure of the particle porosity. Particle porosity occurred particularly at the higher outlet air temperatures and at the lower total solids contents of the concentrate. A good correlation was found between the free fat content of whole milk powder and its porosity. VR
- 1764 LIPINSKA (E). Survival of bifidobacteria under adverse physiological conditions. *Acta Aliment. Polonica.* 5(4); 1979; 359-63
- Four *Lbc. bifidus* strains and their mixed culture used as a starter for fermented milk and cottage cheese production survived partially under adverse physiological conditions which may prevail in the digestive tract. AA

CHEESE

- 1765 CZARNOCKA-ROCZNIAKOWA (B), DREWEK (Z) and KOPCZYNSKA (E). Changes in folacin content in the non-ripening cheese (Tvarog) production process. *Acta. Aliment. Polonica*. 5(4); 1979; 351-8
The lactic acid streptococci used in starters were found to synthesise folacin during the logarithmic phase of growth both in single cultures and in the mixed ones. Folacin content increases by 119% during the acidification of milk to be used for the production of tvarog. Some 45% of this vitamin remains in the cheese and the rest is removed together with the whey. AA
- 1766 El NASHAWY (AA), ABDEL BAKY (AA) and FARAHAT (SM). Enhancement of do-miati cheese flavour with animal lipase preparations. *Egypt. J. Food Sci.* 9(1-2); 1981; 23-30
- 1767 STANLEY (DW), EMMONS (DB), MODLER (HW) and IRVINE (DM). Cheddar cheese made with chicken pepsin. *Can. Inst. Food Sci. Technol. J.* 13(2); 1980; 97-102
- 1768 IBRAHIM (GF), BALDOCK (AK), RADFORD (DR) and IRELAND (LB). Inhibition of *Staphylococcus aureus* growth and enterotoxin A production in cheddar cheese produced with variable starter activity. *J. Food Prot.* 44(4); 1981; 263-7

WHEY

- 1769 HOLLIS (BW), ROOS (BA), DRAPER (HH) and LAMBERT (PW). Occurrence of vitamin D sulphate in human milk whey. *J. Nutr.* 111(2); 1981; 384-90
- 1770 El-FARRA (AA), ISMAIL (AA) and KHORSHID (AMH). Liquid whey milk and its effect on wheat flour dough and pasta properties. *Egypt. J. Food Sci.* 9(1-2); 1981; 49-58
Levels of 25, 50, 75 and 100% of liquid whey resulting from processing cheese, were used for replacing water required for mixing wheat flour dough. It was found that there was a remarkable decrease in water absorption capacity, dough stability, break down valorimeter index, dough resistance to extension and the energy needed for extension of the dough. On the other hand, the dough mixing time and dough extensibility increased. Generally, addition of liquid whey caused a pronounced dough softening action. Liquid whey improved the cooking and eating qualities of macaroni. Use of liquid whey in dough pasta, reduced the cooking loss, while the colour, taste, texture and firmness of the resultant macaroni improved. AA

MEAT AND POULTRY

- 1771 BERSZAN (G). Technological status of the meat industry in Hungary. *Fleisch.* 33(12); 1979; 226-8 (German)
- 1772 ANTAL (J). Development of slaughter house equipment in Hungary. *Fleisch.* 33(12); 1979; 229-31 (German)
- 1773 BAIER (A), DEUTRICH (K), GROSSE (H) and SCHAFER (M). Importance and possibilities of protection against corrosion, represented by example of the meat industry. *Lebensmittel-Industrie.* 27(10); 1980; 443-7 (German)
- 1774 DRECHSLER (D). Transporting thickened sauces and one course meal in pipelines. *Fleisch.* 33(12); 1979; 231-3 (German)

The transportation of thickened sauces by means of complicated pipe connections is possible. On the other hand, the pipes for transporting one course meals should not be complicated and should run straight, in order to keep the parts of friction (pipebends) as low as possible. The V₂A milk pipeline NW40 is preferred, since it can be assembled easily and the risk of breakage is not much. The use of a pump is profitable only when the production is 2000 to 3000 portions per day. KMD

- 1775 IGENE (JO), PEARSON (AM) and GRAY (JI). Effects of length of frozen storage, cooking and holding temperatures upon component phospholipids and their fatty acid composition of meat triglycerides and phospholipids. Food Chem. 7(4); 1981; 289-303

Fatty acid profiles of triglycerides and phospholipids, and the levels of component phospholipids were determined in beef and dark and light chicken meat at 0, 8 and 13 months of frozen storage at -18 C and again after cooking and holding at either 4 C or -18 C for 18 hours. There was a significant decline in the amount of PE (phosphatidyl ethanolamine) and PC (phosphatidyl choline) during frozen storage, but the decline was much greater upon cooking. PE and PC were also more stable following cooking upon holding at -18 C than at 4 C. KAR

- 1776 STANKIEWICZ-BERGER (H) and KITZMAN (P). Investigation of bacteriostatic activity of refined liquid smoke. Acta Aliment. Polonica. 5(4); 1979; 391-8

The bacteriostatic activity of the smoke flavouring has been investigated. It has been found that the Refined Liquid Smoke does not influence the bacterial growth in doses below 200 ppm. AA

- 1777 FINANCE (C), VILLEVAL (F), BLOCK (J-C) and SCHWARTZBROD (L). Improved method for virological analysis of food. Appl. Environ. Microbiol. 42(1); 1981; 176-9

A single, simple method for recovering enteroviruses from several different kinds of food, such as ground beef, fish, oysters, and mussels, has been improved. First, sample contamination technique was studied. It appears that virus adsorption occurs at food pH and varies according to the kind of food and the food-virus exchange surface. Samples are submerged in 100 ml of demineralized water, adjusted to pH 9 with a conductivity of 8,000 mg of NaCl per litre. Then, viruses are concentrated by ultrafiltration or by ultracentrifugation. This method was efficient for virus recovery from the four kinds of food, even in cases of very low contamination. AA

BEEF

- 1778 MAINO (JJ), LINTON (AC) and BRINKS (JS). Postweaning growth and carcass characteristics of various frame size steers on forage systems. J. Anim. Sci. 52(2); 1981; 232-40
- 1779 ANON. Fat in minced beef. Br. Food J. 83(904); 1981; 143-5
- 1780 FORTIN (A), REID (JT), SIMPFENDOREFER (S), AYALA (JH), ANRIQUE (R), KERTZ (AF), MAIGA (AM), SIM (DW) and WELLINGTON (GH). Chemical composition and carcass specific gravity in cattle: effect of level of energy intake and influence of breed and sex. Can. J. Anim. Sci. 61(4); 1981; 871-82
- 1781 FORREST (RJ). Effect of high concentrate feeding on the carcass quality and fat colouration of grass-reared steers. Can. J. Anim. Sci. 61(3); 1981; 575-80
- 1782 HAWRYSH (ZJ) and PRICE (MA). The effect of grain feeding on the eating quality of beef from culled cows. Can. J. Anim. Sci. 61(3); 1981; 581-92

- 1783 HAWRYSH (ZJ), PRICE (MA) and BERG (RT). The influence of roughage level in the finishing diet on the eating quality of beef from bulls and steers slaughtered at two liveweights.
Can. Inst. Food Sci. Technol. J. 13(2); 1980; 71-9
- 1784 JONES (SDM) and MACLEOD (GK). The feedlot performance and carcass composition of young and mature cull holstein cows.
Can. J. Anim. Sci. 61(3); 1981; 593-9
- 1785 GIBRIEL (AY), HUSSEIN (MF), DABASH (AS) and El-DASHLOUTY (AA). Comparative studies on the canned beef and pork.
Egypt. J. Food Sci. 9(1-2); 1981; 1-12
The chemical and physical properties of experimental canned beef, canned pork, and canned beef containing 5 to 50% pork were studied. It was revealed that with increase in pork proportion in the canned beef, the thiamin content, pH value, WHC, and plasticity increased, while the T.N, T.S.N, T.V.N, and amino nitrogen contents, as well as the T.B.A. value, specific gravity and colour intensity decreased. The rate of T.S.N. T.V.N and amino nitrogen increase was higher in beef than in pork, indicating that pork muscle proteins were less susceptible to heat damage. Pork lipids, however, did not survive oxidation by heating, compared to beef lipids. Deterioration of the WHC and colour was more pronounced in pork than in beef during canning, while the rate of tenderness increase was higher for pork possibly because of more liable connective tissue proteins. It was found that the presence of 2.65 mg thiamin/100 g T.N. indicates indisputable adulteration of canned beef products with pork. Applying the thiamin test, it was found that one of the six imported canned meat products was adulterated with pork. AA
- 1786 GREER (GG) and JEREMIAH (LE). Proper control of retail case temperature improves beef shelflife.
J. Food Prot. 44(4); 1981; 297-9
- 1787 FISCHER (C), HONIKEL (KO) and HAMM (R). Influence of below freezing temperatures on the rate of post-mortem metabolism and the water-holding capacity in prerigor frozen beef muscles.
Z. Lebensmittel-Unters. Forsch. 171(3); 1980; 200-5 (German)
- 1788 JAY (JM). Rapid estimation of microbial numbers in fresh ground beef by use of the *Limulus* test.
J. Food Prot. 44(4); 1981; 275-8
- 1789 ROBERTS (TA), BRITTON (CR) and HUDSON (WR). The bacteriological quality of minced beef in the U.K.
J. Hyg. 85(2); 1980; 211-7
Total viable count, numbers of enterobacteriaceae, and presumptive coliforms in minced beef collected from supermarkets, intermediate-sized chain butchers and family butchers were compared. KAR

LAMB

- 1790 GOHLER (H). Some problems regarding determination of the carcass value of fattened lambs.
Fleisch. 33(12); 1979; 236-7 (German)
Fattened lambs, which as hybrids attain a body weight of around 40 kg in 130 to 140 days, exhibit a high quality of meat. The objective determination of carcass quality is of significance for further improvement of the quality of the carcass. The most important criteria are found by examining the live animal, the intact, and the cut-up carcass. The mass of warm carcass and kidney tallow are suitable parameters for an objective evaluation of the carcass. KMD

- 1791 KIRTON (AH), SINCLAIR (DP), CHRYSTALL (BB), DEVINE (CE) and WOODS (EG). Effect of plane of nutrition on carcass composition and the palatability of pasture-fed lamb.
J. Anim. Sci. 52(2); 1981; 285-91

PORK

- 1792 SIELAFF (H) and GASTMANN (C). Ascertainment of the quality of the meat of fattened pigs under the conditions of the meat industry.
Fleisch. 33(12); 1979; 233-5 (German)
Decisive criteria for the quality of meat are the water-absorptive capacity, the colour of the meat and the degree of acidity. The water absorptive capacity was determined with the help of drip loss, the colour brightness measured by spekol and the degree of acidity by the pH value. It was found that *M. longissimus dorsi* has the lowest pH value (5.69 to 6.28), the highest remission value (26.76%) i.e. the brightest meat, and the highest driploss (5.39%). KMD
- 1793 BAUER (FT), CARPENTER (JA), and REAGAN (JO). Prevalence of *Clostridium perfringens* in pork during processing.
J. Food Prot. 44(4); 1981; 279-83

CHICKEN

- 1794 RAO (BV). The poultry industry in India.
World Poult. Sci. J. 38(1); 1982; 40-47
- 1795 ARAFA (AS), BLOOMER (RJ), WILSON (HR), SIMPSON (CF) and HARMS (RH). Susceptibility of various poultry species to dietary aflatoxin.
Br. Poult. Sci. 22(5); 1981; 431-6
- 1796 NORBERG (P). Enteropathogenic bacteria in frozen chicken.
Appl. Environ. Microbiol. 42(1); 1981; 32-4
Eighty-two samples of frozen chicken from retail stores were examined for the presence of *Campylobacter*, *Yersinia enterocolitica*, and salmonellae. Aerobic plate counts and numbers of coliform bacteria at 37 C were determined. *Campylobacter fetus* subsp. *jejuni* was found in 22% of the samples, *Y. enterocolitica* was found in 24.5%, and *Salmonella typhimurium* was found in one sample (1.2%). The isolated strains of *Y. enterocolitica* belonged to serotypes 4, 5b, 6, and 8. Aerobic plate counts and numbers of coliform bacteria at 37 C were not found to be noticeably higher in samples containing pathogens than in pathogen-free samples. This investigation showed that chicken does contain other pathogenic bacteria than salmonellae. *Campylobacter* and *Y. enterocolitica* were isolated in much higher frequencies than *Salmonella*. AA
- 1797 PARK (CE), STANKIEWICZ (ZK), LOVETT (J) and HUNT (J). Incidence of *Campylobacter jejuni* in fresh eviscerated whole market chickens.
Can. J. Microbiol. 27(8); 1981; 841-2
- 1798 THOMAS (CJ) and McMEEKIN (TA). Attachment of *Salmonella* spp. to chicken muscle surfaces.
Appl. Environ. Microbiol. 42(1); 1981; 130-34

EGG

- 1799 MIYAGAWA (K). Calorimetrical measurement on food putrefaction.
J. Jpn. Soc. Food Sci. Technol. 27(11); 1980; 569-72 (Japanese)
The change of heat with the progress of putrefaction at 30 C were measured by twin conductive calorimeter. The heat evolution caused by putrefaction by stirred whole egg and yolk occurred after 4 hours. The heat change with putrefaction of a defrosted fish was faster than that

of a raw fish. It was suggested that the calorimetrical measurement was a useful tool for analysis of putrefaction. KAR

- 1800 ABD EL-BAKI (MM), El-MANSY (HA) and TAHA (RA). Isolation and enumeration of *Salmonella* from dried eggs, their survival in custard subjected to different heat treatments. Egypt J. Food Sci. 9(1-2); 1981; 13-22

Thirty six samples of dried whole egg of German origin were examined for *Salmonella* using the most probable number (1), the enrichment technique (2), and Mossel's technique for enterobacteriaceae and *Salmonella* was isolated and enumerated. The first two methods were more efficient for *Salmonella* than the third method. Custard samples were inoculated with a pure culture of *S. infantis* before cooking and cooked at approximately 85 for different periods. *Salmonella* was still persistent in samples heated for 45 minutes or less and was not detected in samples heated for 60 minutes or more. AA

SEAFOODS

FISH

- 1801 SARVAIYA (PT). Bombay-duck fisheries of Gujarat, with special reference to Jafarabad zone. Seafood Export J. 14(1); 1982; 27,29

- 1802 KIRMSE (D), KADLER (D) and TULSNER (M). Determination of cooking time of minced fish. Lebensmittel-industrie. 27(10); 1980; 455-8 (German)

A possibility of the simple mathematical description of the heat transfer is introduced on the basis of the analysis of the cooking process of fish meat in casings and farm boxes. AA

- 1803 KAFEL (S). Effects of preenrichment media and their incubation conditions on isolating *Salmonella* from fish meal. J. Food Prot. 44(4); 1981; 268-70

- 1804 SAKASHI (N), HAYASHI (K) and NOBUHARA (A). Reduction of elasticity of *Kamaboko* (boiled fish paste) by some additives containing protease. J. Jpn. Soc. Food Sci. Technol. 27(8); 1980; 371-76 (Japanese)

Addition of ginger during the preparation of *Kamaboko* reduced the elasticity of final product, but when the material was heated before the addition, the effect was not seen. It is believed that it is due to the proteolytic activity of the ginger. KAR

SARDINE

- 1805 JOSHI (VR) and SARALAYA (KV). Studies on the effect of precooking in sardine canning. 1. Effect on microflora of fish. Mysore J. Agric. Sci. 15(2); 1981; 322-6

Oil sardine (*Sardinella longiceps*) was precooked in 1 lb jam cans (301 x 309) in steam and analysed for total plate count (TPC), anaerobic plate count (APC), spore counts (aerobic and anaerobic, mesophilic and thermophilic), coliform, *Staphylococcus*, mould and yeast counts. It was found that precooking at 100 C for 30 minutes reduced total counts and APC to one thousandth of their original values. It also completely destroyed non-spore forming bacteria, moulds and yeasts. However, precooking did not have any significant effect on spore forming bacteria. MVG

NOTOTHENIA

- 1806 WAGNER (H). The storage behaviour of marble *Nototothenia* (*Nototothenia rossi marmorata*) and green *Nototothenia* (*Nototothenia neglecta*). Lebensmittel-industrie. 27(10); 1980; 458-60 (German)

The results of the analysis of the storage behaviour of the *Notototheniidae* are dealt with, based on the general biology of this fish species. It became evident that qualitative and quantitative changes take place depending on the storage conditions. AA

SHELL FISH

- 1807 DEXTER (F). Modification of the standard most-probable-number procedure for fecal coliform bacteria in seawater and shellfish. Appl. Environ. Microbiol. 42(1); 1981; 184-5
- 1808 HELLWIG (E) and PETUELY (F). Determination of saxitoxin in canned shellfish. Z. Lebensmittel-Unters. Forsch. 171(3); 1980; 165-9 (German)
- A method for the determination of saxitoxin in canned shellfish was developed. This method offers the advantage that along with the fluorophotometric determination, a biotest on mice can be carried out with the same extract for corroboration of the results. The extent of saxitoxin occurrence in Spanish canned shellfish in Austria in the years 1976-1979 is described. AA

PRAWN

- 1809 NAGARAJ (M) and NEELAKANTAN (B). Prawn culture in Uttara Kannada (N. Canara), Karnataka: An appraisal of the present status and future prospects. Seafood Export J. 14(1); 1982; 13-6

OYSTER

- 1810 EYLES (MJ), DAVEY (GR) and HUNTLEY (FJ). Demonstration of viral contamination of oysters responsible for an outbreak of viral gastroenteritis. J. Food Prot. 44(4); 1981; 294-6

PROTEIN FOODS

- 1811 POST (JE) and BAER (E). The infant formula controversy: consensus, compromise and conflict. Cajanus. 14(4); 1981; 210-25
- 1812 DESIKACHAR (HSR). Development of weaning foods with high caloric density and low hot-paste viscosity using traditional technologies. Food Nutr. Bull. 2(4); 1980; 21-3
- 1813 MALLESCHI (NG), KURUNDA (MR) and DESIKACHAR (HSR). Production of a low cost malted weaning food from ragi. Khadi Gramodyog. 28(8); 1982; 403-5
- Process details, flow sheet, and production cost are given. This is a weaning food suitable for cottage sector. KAR
- 1814 KUMARSINGHE (P) and ABRAHAMSSON (K). Study on home-made weaning foods suitable for Sri Lanka. Indian J. Nutr: Dietet. 18(12); 1981; 442-54
- Home-made weaning food recipes have been formulated, based on rice or wheat flour for use in Sri Lanka. The protein supplements to the

staples which have been used are different pulses or a small dried fish (sprats). Dark green leaves (gotukola) were used as the vitamin and mineral supplement. Coconut-milk has been used both as a source of fat and protein. Chemical scores were calculated and a biological evaluation (NPU, BV and TD) of the protein quality, was performed using rats. The NPU values varied between 55 to 74 among the five rice recipes and between 55 and 67 among the wheat recipes. The NDPE per cent varied between 6 and 10, which shows that the protein content and quality are satisfactory for older infants and young children. AA

- 1815 FAHMAY (A), NOAMAN (M), AMMAR (K) and ZEIN (R). Chemical and technological studies on baby foods. II. Amino acids composition. Egypt. J. Food Sci. 9(1-2); 1981; 59-74
Amino acid composition of lima bean, corn, barley, soyabean polished broken rice, skim-milk powder and chicken intestine were determined. Precooking of the samples reduced the amino acids content. Germination of the seeds increased their amino acids. These ingredients were found suitable for baby food formulation, because of their high amino acids content. Amino acid composition of the four formulated baby food samples indicated that formula III (contained germinated seeds) had the highest amino acid content as compared to other formulae examined. AA
- 1816 FAHMAY (A), NOMAAN (M), AMMAR (K) and ZEIN (R). Chemical and technological studies on baby foods. III. Vitamin content and net protein utilization (NPU). Egypt. J. Food Sci. 9(1-2); 1981; 75-92
Ascorbic acid, thiamin, riboflavin, pyridoxal and β -carotene were determined in dried, cooked and germinated lima bean, corn, barley and soyabean seeds. These nutrients were also determined in polished rice, skim-milk powder and the baby food formulated from these ingredients. Generally, the four baby food formulas studied, were deficient in ascorbic acid, thiamin, riboflavin and pyridoxal. The results indicated that formulae IV had the highest net protein utilization value and the acceptable range than other as it was based on germinating seeds. AA
- 1817 MALCOLMSON (LJ) and McDANIEL (MR). Magnitude estimation of infant foods. II. Taste, texture and odour of infant formulas. Can. Inst. Food Sci. Technol. J. 13(2); 1980; 56-63
Thirteen infant formulas were evaluated by a trained sensory panel using magnitude estimation. Of the formulas evaluated, five were commercially prepared formulas based on cow's milk, four were commercially prepared formulas based on soy isolate and four were home-made formulas prepared using whole and evaporated milk. Five odour (sweet, sour, cereal, hay/beany, evaporated milk), six flavour-by-mouth (sweet, sour, bitter, cereal, hay/beany, evaporated milk) and two textural (mouthcoating, astringency) characteristics were evaluated for each formula. All formulas were perceived to be mouthcoating, astringent, sweet, and have an evaporated milk flavour. As well, all formulas were found to have a slight cereal and evaporated milk odour. The 1 to 2 week whole and evaporated milk formulas and the soy based formulas were found to be extremely sweet and were significantly sweeter than the 5 to 6 month whole and evaporated milk formulas and the commercially prepared cow's milk formulas. As expected, the soy based formulas were also found to have a strong hay/beany flavour. The evaporated milk formulas and the commercially prepared cow's milk formulas had a strong evaporated milk flavour. Placement of the infant formulas on the basic taste power functions permitted a direct comparison of the intensity of the basic tastes of the formulas to the basic taste stimulant. AA
- 1818 MALCOLMSON (LJ) and McDANIEL (MR). Magnitude estimation of infant foods. III. Taste and texture of infant cereals. Can. Inst. Food Sci. Technol. J. 13(2); 1980; 64-70
Three dilutions of six infant cereals were evaluated by a trained sensory panel using the method of magnitude estimation. A total of four flavour-by-mouth characteristics (sweet, bitter, hay/beany, cereal) and

five textural characteristics (viscosity, mouthcoating, astringency, pulpiness, chalkiness) were evaluated for each cereal. All cereals were found to be in varying degrees viscous, mouthcoating, astringent and have a slight cereal flavour. All cereals except Sobee were considered to be pulpy. Sobee was perceived as being chalky. Most cereals were also found to be slightly sweet and have a slight hay/beany flavour. The two soy cereals were also found to be slightly bitter and were in general the most complex of cereals evaluated in terms of flavour and texture intensities. Rice was the least complex cereal. Few differences in the sensory properties of rice, barley, oatmeal and mixed cereals were found. Generally, the intensity of a sensory parameter increased with a corresponding increase in the solids content of the cereal. Placement of the infant formula on the basic taste power function permitted a direct comparison of the intensity of the cereal to the basic taste stimulant. AA

- 1819 JANSEN (GR). A consideration of allowable fibre levels in weaning foods. Food Nutr. Bull. 2(4); 1980; 38-47

FRUIT JUICES AND BEVERAGES

- 1820 HOLZINGER (R). The degassing of fruit and vegetable juices as a basic requirement for a smooth and quality oriented filling. Flussiges Obst. 47(9); 1980; 362-6 (German)
- 1821 ARMGARD (S). Fruit juice in "portion boxes". Flussiges Obst. 47(9); 1980; 367-72 (German)
- 1822 DULLINGER (K). Labeling: An effective and technical function. Flussiges Obst. 47(9); 1980; 374-86 (German)
- 1823 SCHNEIDER (A). Special questions concerning the use of material handling equipments in the fruit juice and fruit wine industry. Flussiges Obst. 47(9); 1980; 410-6 (German)
- 1824 WEISSENBACH (MJ). Questions of energy saving measures in the fruit juice industry. Flussiges Obst. 47(9); 1980; 390-97 (German)

ORANGE JUICE

- 1825 EL SHERBINY (GA) and RIZK (SS). Variability of chemical constituents related to quality of frozen orange juices during the production season. Egypt. J. Food Sci. 9(1-2); 1981; 103-12

A study was undertaken to test the quality attributes of frozen pasteurized juices from Balady and Valencia oranges harvested at different times from December 15th to February 28 for Balady and from March 15th to May 30 for Valencia. It was concluded that the best time to start processing orange juice was January 1st for Balady and April 15th for Valencia. At these times, the total soluble solids/acid ratio was around 9 for both varieties; also volatile oil contents had decreased, but they were still higher than the recommended percentage (0.05%). Other quality attributes such as sugars, pulp, percentage cloud, limonin, water insoluble solids, alcohol insoluble solids, ascorbic acid, carotenoids, amino nitrogen, pectic substances, pectinmethyl-esterase and organoleptic properties were determined; the results are discussed. AA

- 1826 DRAWERT (F) and NITSCHKE (T). A simple method for the determination of total α -amino acids (α -amino nitrogen) in orange juices. Chem. Mikrobiol. Technol. Lebensm. 7(4); 1982; 97-101 (German)

The paper describes a new method which allows the determination of total α -amino acids quantitatively by oxidative decarboxylation with

ninhydrin. The resulting carbon dioxide is equivalent to the α -amino nitrogen, and is titrated after trapping with barium hydroxide. Amino acid analysis of orange juices according to Moore and Stein gave good results, whereas formole titration as per IFU failed to do so. VR

MANGO JUICE

- 1827 El-SAMAHY (SK), ASKAR (A), ABD EL-BAKI (MM) and ABD EL-FADEEL (MG). Concentration of mango juice. 2. Aroma deterioration during the concentration.

Chem. Mikrobiol. Technol. Lebensm. 7(4); 1982; 102-6

Mango juice was concentrated using four methods i.e. freeze-concentration, evaporation under vacuum with cut-back, centrifugal separation of the juice into pulp and serum, the serum was concentrated alone, using freeze-concentration or evaporation, and recombined with the pulp to produce the concentrate. The gas chromatographic analysis of the aroma of fresh and concentrated mango juice showed a remarkable change. The percentage decrease of most of the aroma compounds was higher in case of concentration by evaporation than in case of freeze-concentration method. On the other hand, there was a noticeable increase in α -terpineol when evaporation was used. The best results were obtained by the concentration using serum-pulp-method. AA

- 1828 El-SAMAHY (SK), ABD EL-BAKI (MM), ABD EL-FADEEL (MG) and ASKAR (A). Concentration of mango juice. 3. Quality changes of Zebda mango juice concentrates during storage.

Chem. Mikrobiol. Technol. Lebensm. 7(4); 1982; 107-2

The results showed that there was a remarkable decrease in ascorbic acid and colour index, and an increase in pulp content by prolonging the storage period. Concentrate produced by using serum pulp method generally showed lower changes than that produced by the conventional method. Zebda mango juice concentrates stored at 10 F gave reconstituted juices that were graded as "very good", while those kept at 40 F gave reconstituted juices that were graded as "acceptable". VR

TEA

- 1829 BROWN (HL). Low-cal iced tea reaches new high. Tea Coffee Trade J. 153(12); 1981; 18-9,37

- 1830 ANAN (T), AMANO (I) and NAKAGAWA (M). Changes in the contents of some ingredients during heating of green tea.

J. Jpn. Soc. Food Sci. Technol. 28(2); 1981; 74-8 (Japanese)

Crude green tea was heated at 130 C for 30 minutes and at 160 C for 30 minutes. The analysis of some ingredients indicated that amino acids, free reducing sugars and vitamin C contents decreased remarkably during heating, while caffeine and total nitrogen hardly decreased. Furthermore, by use of theanine, glucose, (-) epicatechin and caffeine as model compounds, the interaction among them during heating was investigated. The results indicated that the interaction between theanine and glucose was observed remarkably, and that between theanine and (-)-epicatechin was observed a little. AA

COFFEE

- 1831 KNOTZSCH (P). Drinking coffee: Usages and tendencies. Lebensmittel Industrie. 27(10); 1980; 461-3 (German)

Trends in consumption of roasted coffee in GDR are explained on the basis of statistical material. It was evident that there is to be only a small expansion of the consumer group, but the quantitative per capita consumption will increase in future. AA

COCOA

- 1832 PFEILSTICKER (K) and LEYENDECKER (A). Structure of theobromine derivatives from cocoa powder formed by fumigation with ethylene oxide (EO). *Z. Lebensmittel-Unters. Forsch.* 171(3); 1980; 174-7 (German)

Four derivatives of theobromine from cocoa powder fumigated with ethylene oxide (250-1000 g/m³ EO, 20 C, 6 hours) were isolated by extraction with chloroform, polyamide chromatography and thin layer chromatography. Based on UV- and mass spectrometry, the structure suggested is 1-(2-hydroxyethyl) theobromine (derivative 1) and higher glycolether-derivatives with an oligomerisation degree upto n=4. AA

ALCOHOLIC BEVERAGE

- 1833 NANDODE (SK), AMBADE (KA) and MEGHAL (SK). Rapid assay of alcohol in alcoholic beverages by flash point determination. *Res. Ind.* 27(2); 1982; 174-7

Ethyl alcohol from 25 alcoholic beverages was determined by flash point method. The data obtained was found to be comparable to those obtained from standard distillation methods. Most of the samples showed flash points of 26.5 C and a total solid content of 0.01-1.5 g/100 ml. The mean of the differences between the two methods was 0.46% v/v of ethanol. BSN

BEER

- 1834 HIRANO (K), ONO (M), HASHIMOTO (S), TAKAHASHI (T) and KUMADA (J). Oligosaccharides in beer. *J. Jpn. Soc. Starch Sci.* 28(2); 1981; 118-24

Carbohydrates in beer originate mostly from starchy raw materials, such as malt, starch and rice. Hop, one of essential brewing materials, however, is not significant as a source of beer carbohydrates. Reflecting the composition of the raw materials, major carbohydrates in beer are degradation products of starch, which are distributed in a wide range of polymerization degree. These dextrans consist of a number of isomers, which are either linear or branched. Beer also contains many minor constituents as follows: pentoses and their dextrans, oligosaccharides consisting of various kinds of sugars, such as galactose and fructose and oligosaccharides which are considered to be formed either by transglycosidation on or during brewing process. The classification of 128 brands of beer brewed in 19 countries was attempted according to their carbohydrate composition, fermentable sugars and dextrans. Carbohydrate composition in beer can be regulated by selection of raw materials and by modification of brewing procedures. Among these methods, the effect of utilization of malt amylases, utilization of an external enzyme and addition of sugars to wort and beer on the carbohydrate composition and quality of beer were investigated in detail. AA

WINE

- 1835 SCHREIER (P) and DRAWERT (F). The aroma composition of fruit wines. II. Bilberry wine. *Chem. Mikrobiol. Technol. Lebensm.* 7(4); 1982; 125-8 (German)

The volatile components of two self-made and four commercial bilberry wines were separated by standard controlled liquid-liquid extraction and investigated by column chromatography on silica gel, gas chromatography and combined gas chromatography-mass spectrometry. Quantitative gas chromatography comprised 43 compounds, among them furfural, 5-methylfurfural and ethyl 4-oxopentanoate, identified in some commercial samples, indicate the use of juice concentrates for the production of these fruit wines. The occurrence of butyl 3-methylbutanoate and ethyl 2- and 3-methylbutanoates detected in the commercial samples together with a

high amount of benzyl alcohol suggests an unlawful addition of flavour substances during processing. AA

BRANDY

- 1836 PATEL (JD), VENKATARAMU (K) and SUBBA RAO (MS). Mahua (*Madhuca longifolia* Macb) flowers as a raw material for brandy. Res. Ind. 27(3); 1982; 251-4

Dried mahua flowers are a rich source of sugar and hence a good raw material for alcoholic fermentation. Trials were conducted with up to 99 kg of flowers/batch, using water for extraction in the ratio of 1:3 by different methods. Subsequently, it was fermented with a suitable strain of the yeast, *Saccharomyces cerevisiae*, for production of brandy. The fermented brew was distilled with the help of a stainless steel pot still. The distillate was used for the preparation of brandy. The yield of alcohol by sequential extraction was found to be superior to other methods. The brandy was analysed for alcohol, esters, aldehydes, volatile acidity and higher alcohols after ageing in oak barrels. It was found that all these constituents were well within the ISI specification for brandy. Mahua brandy has desirable flavour and bouquet. BSN

OILS AND FATS

- 1837 ACHAYA (KT). Three fat filled decades. J. Oil Technol. Assoc. India. 14(1); 1982; 21-7
A review of three decades of research work done in India, by the author in the chemistry of oils and fats and their applications and uses. KMD
- 1838 MENON (KKG). Problems facing oils and fats industry in India. J. Oil Technol. Assoc. India. 14(1); 1982; 28-31
The Prevention of Food Adulteration Act, at present in force in India, has become obsolete in many respects. The author has drawn attention to the existing anomalies relating to the specifications for edible oils and fats and the methods of analysis employed to ensure adherence to the aforesaid specifications. He has also made nine specific recommendations to remedy the anomalies. KMD
- 1839 GODREJ (NB). Processing of minor oils. J. Oil Technol. Assoc. India. 14(1); 1982; 39-40
This paper briefly describes the method of extraction of oil from mowrah, sal, neem, karanj, kusum, khakhan, kokum, nahor, undi, pisa, and dhupa trees and their industrial applications. Only mowrah oil and sal fat are suitable for use as confectionery fats. KMD
- 1840 Van DELDEN (JR), COZIJNSEN (JL) and FOLSTAR (P). The determination of the cholesterol content in ready-to-serve foods by gas-liquid chromatography. Food Chem. 7(2); 1981; 117-24
Lipids were extracted from previously freeze-dried foods (a) with petroleum ether (40-60 C) in a Soxhlet apparatus or (b) with a mixed solvent system of chloroform: methanol: water in a waring blender and the amount of cholesterol was measured by GLC. KAR
- 1841 COCHRAN (WM) and BAEUERLEN (RJ). Formulation, innovations and other developments in shortenings, margarines and oils. Baker's Dig. 55(5); 1981; 16-20
After reviewing the relative functional contributions of base oils and emulsifiers in shortenings and margarines, the authors deal with latest developments in the field with a note on future trends. KAR

- 1842 LORUSSO (S). Hydrogenation of fats: Margarine.
Ind. Aliment. 21(1); 1982; 27-31 (Italian)
- 1843 INSTITUTE OF FOOD TECHNOLOGIST'S EXPERT PANEL. Fats in the diet. Why and where? A scientific status summary.
Food Technol. 35(12); 1981; 33-8
- 1844 MANI (VVS). Edible fat products: Possibilities.
J. Oil Technol. Assoc. India. 14(1); 1982; 41-3
The author has discussed the need to produce certain types of edible fats that are needed in India today, viz. PUFA, vanaspati, margarines and shortenings, table margarine, bakery margarines, and coffee whiten-er. The technology used to make these products has also been mentioned.
KMD
- 1845 CURRAN (SS), and ZINKEL (DF). Argentation resin chromatography of di-terpene resin acids.
J. Am. Oil Chem. Soc. 58(11); 1981; 980-82
- 1846 LEE (CM), HAMPSON (JW) and ABDOLLAHI (A). Effect of plastic fats on thermal stability and mechanical properties of fat-protein gel products.
J. Am. Oil Chem. Soc. 58(11); 1981; 983-7
- 1847 LOWRY (RR) and TINSLEY (IJ). Some observations on the AOAC method for the analysis of brominated oils.
J. Am. Oil Chem. Soc. 58(11); 1981; 991-3
Increased sensitivity and improved reproducibility in the analysis by gas liquid chromatography of brominated oils has been obtained by re-esterification following debromination. The variety of reactions that can occur at various temperatures and their effects on the procedure are discussed. In addition to defining optimal procedures, it was es-tablished that reagents that are more easily and safely handled than metallic sodium give equivalent results. AA
- 1848 LEUPOLD (G) and DRAWERT (F). Gas-chromatographic determination of the composition of fatty acids in salad dressing by gas-liquid chromatography.
Chem. Mikrobiol. Technol. Lebensm. 7(4); 1982; 113-6 (German)
- 1849 MAXWELL (RJ), REIMANN (KA) and PERCELL (K). Determination of the unsa-ponifiable matter in fatty acids by a rapid column method.
J. Am. Oil Chem. Soc. 58(11); 1981; 1002-4
- 1850 PETERSSON (B), PODLAHA (O) and TOREGARD (B). HPLC separation of natu-ral oil triglycerides into fractions with the same carbon number and num-bers of double bonds.
J. Am. Oil Chem. Soc. 58(11); 1981; 1005-9
A high performance liquid chromatographic method was developed and tested on palm oil, low-erucic-acid rapeseed oil and cocoa butter. A 100/cm long column was used, packed with Nucleosil-5 C18 and using ace-tonitrile/acetone, 60:40 (v/v) as mobile phase. Using this system, the oils could be separated directly into fractions specified by having the same carbon number and number of double bonds. Earlier, the same frac-tionation could be obtained only by a 2-step chromatographic separation. The fractions have been found to be very pure and to have simple trigly-ceride composition with only one totally dominating triglyceride type in almost all cases. AA
- CANOLA OIL
- 1851 SEBEDIO (JL) and ACKMAN (RG). Fatty acids of canola *Brassica campestris* var. candle seed and oils at various stages of refining.
J. Am. Oil Chem. Soc. 58(11); 1981; 972-3

- 1852 deMAN (JM), El-SHATTORY (Y) and deMAN (L). Hydrogenation of canola oil (Tower).
Chem. Mikrobiol. Technol. Lebensm. 7(4); 1982; 117-24

OLIVE OIL

- 1853 GUTFINGER (T). Polyphenols in olive oils.
J. Am. Oil Chem. Soc. 58(11); 1981; 966-8
The levels of total polyphenols and o-diphenols were determined in virgin oils and in chloroform/methanol-extracted oils. The solvent extracted oils were richer in polyphenols than the virgin oils. High polyphenol content was associated with a high resistance to oxidation of the oils. A linear relationship was found between polyphenol content and the oxidative stability of the virgin oils during storage at 60 C. After removal of the polyphenols, the oxidative stability of the oils decreased considerably and seemed to depend on polyunsaturated fatty acid concentration. AA

SPICES AND CONDIMENTS

- 1854 SCHULZ (JM) and HERRMANN (K). Occurrence of hydroxybenzoic acids and hydroxycinnamic acids in spices. IV. Phenolics of spices.
Z. Lebensmittel-Unters. Forsch. 171(3); 1980; 193-9 (German)
Hydroxycinnamic and hydroxybenzoic acids were determined qualitatively and quantitatively in nearly all common spices, after release from their naturally occurring derivatives. In tropical spices, hydroxybenzoic and hydroxycinnamic acids were found at the same concentration level, mostly between 10 and 200 ppm. In the green spice herbs, which generally grow in this region, the content of hydroxycinnamic acids dominates. Apiaceae (Umbelliferae), Lamiaceae (Labiatae) and Asteraceae (Compositae) showed contents of caffeic acid in the range of 0.1 to more than 2% in dried samples. In aniseed and white mustard seed, 0.1% p. hydroxybenzoic acid was found. AA

SENSORY EVALUATION

- 1855 SCHAEFER (EE). Sensory discovery scale-up, and sensory cycles.
Food Technol. 35(11); 1981; 65-6,69

FOOD STORAGE

Nil

INFESTATION CONTROL AND PESTICIDES

- 1856 PATEL (RC). Problems and strategies in pest management.
Pestology. 5(5); 1981; 24-30
- 1857 BORKOVEC (AB) and SAXENA (SC). Chemical regulation of reproduction in insect pest management.
Pestology. 5(7); 1981; 27-9
- 1858 RENAPURKAR (DM) and GOSAVI (AV). The cockroaches, their habits and control.
Pestology. 5(7); 1981; 23-5

- 1859 HODGES (RJ). A review of the biology and control of the greater grain borer *Prostephanus truncatus* (Horn): (COLEOPTERA; BOSTRICHIDAE). Trop. Stored Prod. Inf. No. 43; 1982; 3-9
Aspects covered include recognition features; distribution; pest status; life history; behaviour and control. Seriousness of the pest and changes needed in farm storage practice for efficient control are discussed. A key to the Bostrichidae commonly associated with stored products, including *Prostephanus truncatus*, is appended. AA
- 1860 MATHEWS (BL) and STEER (BD). Pesticides field problems and chemical analysis. Pesticides. 16(2); 1982; 1-3
- 1861 WING (KD) and HAMMOCK (BD). Immunochemical methods to detect pesticide residues. Pestology. 5(7); 1981; 15-6
- 1862 RAJENDRAN (S) and MUTHU (M). Detection of acrylonitrile and ethylene oxide in air and fumigated foodstuffs. Bull. Environ. Contam. Toxicol. 27(3); 1981; 426-31
Reports the use of a simple paper strip method for detection of acrylonitrile and ethylene oxide in air and in several fumigated foods (paddy, wheat, polished raw rice, semolina, split chickpeas, curry powder, dry dates). The minimum detectable concentration by this method is 0.34 g/m³ for acrylonitrile and 1.58 g/m³ for ethylene dioxide. BSN

BIOCHEMISTRY AND NUTRITION

- 1863 WARNER (K), BOOKWALTER (GN), RACKIS (JJ), HONIG (DH), HOCKRIDGE (E) and KWOLEK (WF). Prevention of rancidity in experimental rat diets for long-term feeding. Cereal Chem. 59(3); 1982; 175-8
Experimental rat diets containing casein as the sole protein source were aged 24 and 37 C for six months. Test variables included antioxidant effect and types of casein, fat, and iron. Samples were analyzed by a trained, experienced sensory panel for rancid odour intensity and by gas chromatography for pentanal and hexanal formation. Antioxidants in the diets effectively prevented rancid odour development and formation of pentanal and hexanal. Diets without the antioxidant combination of butylated hydroxyanisole and tertiary butylhydroquinone developed rancid odours and generated large amounts of the two aldehydes after four days of storage at 37 C and after eight days of storage at 24 C. Neither iron nor fat type had a significant effect on rancid odour development or on the content of aldehydes in the aged diets. The diets containing vitamin-free casein (alcohol-washed) had higher intensities for rancid odour and greater contents of pentanal and hexanal than did diets prepared with regular lactic casein. Logs of pentanal and hexanal contents correlated significantly with odour intensity values for rancidity in diets without antioxidants. AA
- 1864 WILLIAMS (VJ) and SENIOR (W). Effects of food restriction and body weight loss on metabolic fecal nitrogen excretion in the rat. J. Nutr. 111(4); 1981; 581-5
- 1865 KNEHANS (AW), JOHANNING (GL) and O'DELL (BL). Relationship between fiber rich foods and serum sterols in Guinea pigs. Nutr. Rep. Int. 24(6); 1981; 1075-85
- 1866 AKSNES (A) and NJAA (LR). Oxidation of methionine: Effect of ascorbic acid autooxidation. Food Chem. 7(4); 1981; 305-10
The results indicate that ascorbic acid must autooxidise before reacting with methionine. Catalase, histidine and scavengers of hydroxyl radical (benzoic acid and ethanol) inhibit the reaction. Dehydro-

ascorbic acid also oxidises methionine, but at a much slower rate than ascorbic acid. In the presence of ascorbic acid, the main product in the reaction is methionine sulphoxide, but other products are also formed. KAR

- 1867 ANON. Nutritional influences on lead absorption in man. Nutr. Rev. 39(10); 1981; 363-5
- 1868 ANON. Effects of lead on glutathione metabolism. Nutr. Rev. 39(10); 1981; 378-9
- 1869 PAO (EM) and MICKLE (SJ). Problem nutrients in the United States. Food Technol. 35(9); 1981; 58-62,64,66-9,79
- 1870 KNUDSEN (OK). Nutrition and food needs in South Asia: A review of research on magnitudes, policy, and prospects. Food Technol. 35(9); 1981; 105-9
- 1871 UNDERWOOD (BA). Strategies for the prevention of vitamin A deficiency. Food Nutr. Bull. 2(4); 1980; 11-4
- 1872 REUTLINGER (S). Determining the prevalence of calorie deficient diets in developing countries by alternative methods of measurement. Food Nutr. Bull. 2(4); 1980; 15-20
- 1873 BRESSANI (R), BRAHAM (JE) and ELIAS (LG). Human nutrition and gossypol. Food Nutr. Bull. 2(4); 1980; 24-32
- 1874 DEVADAS (RP), KAMALANATHAN (G) and VIJAYALAKSHMI (P). Leaf protein feeding trial with preschool children at Coimbatore. IV. Evaluation of the leaf protein feeding programme. Indian J. Nutr. Dietet. 18(12); 1981; 427-34

TOXICOLOGY AND HYGIENE

- 1875 HARRIS (JE) and MORGENROTH (VH). Toxicity testing guidelines and standards: Their role in retrospective safety reviews. Food Technol. 35(12); 1981; 75-6
- 1876 SCHAFFNER (RM). Lead in canned foods. Food Technol. 35(12); 1981; 60,62,64
Aspects covered include health effects of lead, daily lead intake from foods, lead exposure of Americans and FDA action of lead limits. KAR
- 1877 MAHAFFEY (KR). Nutritional factors in lead poisoning. Nutr. Rev. 39(10); 1981; 353-62
Discusses: effect on health; influence on nutrition and lead toxicity; effect on metabolism of nutrients; and susceptible human populations. BSN
- 1878 ANON. Metabolism of vitamin D in lead poisoning. Nutr. Rev. 39(10); 1981; 372-3
- 1879 BERNARD (A), LAUWERYS (R) and GENGOUX (P). Characterization of the proteinuria induced by prolonged oral administration of cadmium in female rats. Toxicology. 20(4); 1981; 345-7
- 1880 KEHRER (JP) and WITSCHI (H). The effect of indomethacin, prednisolone and *cis*-4-hydroxyproline on pulmonary fibrosis produced by butylated hydroxytoluene and oxygen. Toxicology. 20(4); 1981; 281-8

- 1881 NAGANO (K), NAKAYAMA (E), OOBAYASHI (H), YAMADA (T), ADACHI (H), NISHIZAWA (T), OZAWA (H), NAKAICHI (M), OKUDA (H), MINAMI (K) and YAMAZAKI (K). Embryotoxic effects of ethylene glycol monomethyl ether in mice. *Toxicology*. 20(4); 1981; 335-43
- 1882 MAC (MJ) and SEELYE (JG). Potential influence of acetone in aquatic bioassays testing the dynamics and effects of PCBs. *Bull. Environ. Contam. Toxicol.* 27(3); 1981; 359-67
- 1883 LARKIN (EP). Food contaminants. Viruses. *J. Food Prot.* 44(4); 1981; 320-25
- 1884 CANTONI (C), SONCINI (G) and D'AUBERT (S). A foodborne disease in man and animals, caused by streptococci A and C. *Ind. Aliment.* 21(1); 1982; 12-4 (Italian)
A disease characterized by non-purulent impetigo and skin itch has been caused in human beings and their dogs, by horse meat. Strains isolated from the meat include *Streptococcus pyogenes*, *Str. zooepidemicus*, and *Str. equisimilis*. KMD
- 1885 KNOOP (FC) and ABBEY (DM). Effect of chemical and pharmacological agents on the secretory activity induced by *Escherichia coli* heat stable enterotoxin. *Can. J. Microbiol.* 27(8); 1981; 754-8
- 1886 KOCH (HA), KNEIST (S) and RADEMACHER (KH). Trends in mycotoxins research. *Lebensmittel-industrie*. 27(10); 1980; 451-4 (German)
Mycotoxins may cause serious diseases to animals and mankind. In this article the important aspects of their origin as a result of ingestion of foodstuffs and feeds by moulds, and their effects are described. Special attention is paid to zearalenones, trichothecenes and patulin. Moreover, a survey on the suitable analytical methods for recognition and quantitative determination of mycotoxins is given. Finally, the necessity of intensified efforts to prevent mycotoxicosis is pointed out. KMD
- 1887 KYRIAKIDIS (N), WAIGHT (ES), DAY (JB) and MANTLE (PG). Novel metabolites from *Penicillium crustosum*, including penitrem E, a tremorgenic mycotoxin. *Appl. Environ. Microbiol.* 42(1); 1981; 61-2
- 1888 SEKITA (S), YOSHIHARA (K), NATORI (S), UDAGAWA (S), MUROI (T), SUGIYAMA (Y), KURATA (H) and UMEDA (M). Mycotoxin production by *Chaetomium* spp. and related fungi. *Can. J. Microbiol.* 27(8); 1981; 766-72
- 1889 MAITI (PK). Aflatoxin. *Sci. Cult.* 48(3); 1982; 83-7
A general article dealing with various aspects on aflatoxin including characterization; sources and occurrence; properties and analytical methods; metabolism and biochemical effects; effects in experimental animals; aflatoxicosis in man; and guidelines for health protection. MVG
- 1890 ZAMIR (LO) and HUFFORD (KD). Precursor recognition by kinetic pulse-labeling in a toxigenic aflatoxin B -producing strain of *Aspergillus*. *Appl. Environ. Microbiol.* 42(1); 1981; 168-73
- 1891 STEWART (AW). Survival of bacteria in "Soul Foods" at 10-centigrade. *J. Food Prot.* 44(4); 1981; 271-4

GENERAL

- 1892 CAMPBELL (PN). Some thoughts on science and technology in India.
Arogya. 8(1); 1982; 31-3
- 1893 DANDEKAR (VM). On measurement of poverty.
Econ. Pol. Wkly. 26(30); 1981; 1241-50
- 1894 RAO (HS). Role of patents system in technology transfer.
Invent. Intell. 17(1-2); 1982; 24-31
- 1895 BHATNAGAR (MP). Patent infringement and revocation under the Indian patent law.
Invent. Intell. 17(1-2); 1982; 32-5
- 1896 SUBBARAM (NR). Guidelines for drafting statement of claims in complete specification accompanying an application for patent.
Invent. Intell. 17(1-2); 1982; 36-41
- 1897 SHANTI KUMAR. Questions and answers in patents, designs and trade marks.
Invent. Intell. 17(1-2); 1982; 43-68
- 1898 NJEET KUMAR. Aquatic biomass: A multipurpose resource.
Invent. Intell. 17(3); 1982; 103-8
- 1899 ANON. The United Nations University and post-harvest food conservation.
Food Nutr. Bull. 4(2); 1982; 1
- 1900 ANDERSEN (P-P). Introducing nutritional considerations into agricultural and rural development.
Food Nutr. Bull. 4(2); 1982; 33-41
- 1901 TEREK (S) and BUZDIN (I). Role of the international cooperation for the acceleration of the scientific technical progress in the Food Industry.
Lebensmittelindustrie. 27(11); 1980; 481-5 (German)
- 1902 APPENDINO (G), BELLIARDO (F), NANO (GM) and STEFENELLI (S). Sesquiterpene lactones from *Artemisia genipi* Weber: Isolation and determination in plant material and in liqueurs.
J. Agric. Food Chem. 30(3); 1982; 518-21
- 1903 ANON. Social changes lift frozen foods.
Food Flavour. Ingrid. Process. Pack. 4(1); 1982; 31

FOOD PROCESSING AND PACKAGING

- 1904 THOMPSON (DR). Production optimization.
J. Food Process. Preserv. 6(1); 1982; 1-13
- 1905 SCHWARTZBERG (HG) and CHAO (RY). Solute diffusivities in leaching processes.
Food Technol. 36(2); 1982; 73-86
- 1906 HELDMAN (DR). Food properties during freezing.
Food Technol. 36(2); 1982; 92-6
Aspects covered include state of water in frozen foods, density of frozen foods, enthalpy of frozen foods, apparent specific heat of frozen foods, thermal conductivity of frozen foods and use of frozen food properties. KAR

- 1907 BIZIAK (RB), SWARTZEL (KR) and JONES (VA). Energy evaluation of an ultra-high temperature shell-and-tube processing system. J. Food Sci. 47(6); 1982; 1875-8
- 1908 SWARTZEL (KR). Arrhenius kinetics as applied to product constituent losses in ultra-high temperature processing. J. Food Sci. 47(6); 1982; 1886-91
Product constituent losses in ultra high temperature processing were examined with Arrhenius kinetics. An iteration procedure was utilized to develop time-temperature relationships for tubular heating systems. After introduction of the time-temperature relationship into the Arrhenius equation, integration was performed to yield relationships representing product constituent losses. Time-temperature conditions for a direct system required to achieve the same losses were determined. A unique condition developed where direct and indirect systems may be designed having equivalent losses, independent of activation energies. An example is demonstrated utilizing whole milk heated by commercially available direct and indirect systems. Losses in five constituents were investigated for fifteen different indirect heating conditions. The mathematical uniqueness of the equivalence is examined. AA
- 1909 RAMASWAMY (HS), LO (KV) and TUNG (MA). Simplified equations for transient temperatures in conductive foods with convective heat transfer at the surface. J. Food Sci. 47(6); 1982; 2042-7, 2065
- 1910 PAUL SINGH (R). Thermal diffusivity in food processing. Food Technol. 36(2); 1982; 87-91
After reviewing the mathematical considerations, the author describes the method of determining thermal diffusivity like, least square estimation, use of heat penetration curves, use of time temperature charts, and use of analytical solutions. Some of the important applications of these methods are given along with the models for predicting thermal diffusivity. KAR
- 1911 MUDGETT (RE). Electrical properties of foods in microwave processing. Food Technol. 36(2); 1982; 109-15
The article reviews the effects of frequency, temperature, chemical composition, and physical state on the electrical properties of food products at microwave frequencies, and relate these properties to product heating characteristics in microwave food processing. KAR
- 1912 SUNDERLAND (JE). An economic study of microwave freeze-drying. Food Technol. 36(2); 1982; 50-56
An economic study of the costs of freeze-drying food by conventional and microwave freeze-drying is presented. The costs per pound of frozen food processed are presented for a freeze-dryer with 215 sq.ft. of shelf surface which is equipped with radiant heaters or a combination of radiant and microwave heaters. The total estimated cost per pound of frozen food product is \$0.124 and \$0.0824 for conventional and microwave drying respectively. KAR
- 1913 SHAPIRO (RG) and BAYNE (JE). Microwave heating of glass containers. Food Technol. 36(2); 1982; 46-8
The results indicate that consumer microwave heating of hot-filled foods in commercial wide mouth, soda-lime containers is feasible. It will not cause breakage. Closures should be removed to avoid possibilities of pressurization of jars. For uniform heating, the contents should be stirred at least once midway through heating. The container should be removed from the oven when the contents are adequately heated and should not be allowed to remain at a rolling boil in order to minimize the exposure of the container to cavitation. KAR

- 1914 RAO (MA) and ANANTHESWARAN (RC). Rheology of fluids in food processing. Food Technol. 36(2); 1982; 116-26
Non-Newtonian fluid phenomena in food unit operations particularly of flow in pipes flow in channels, and pasteurization have been reviewed. KAR
- 1915 THOMPSON (DR). The challenge in predicting nutrient changes during food processing. Food Technol. 36(2); 1982; 97-108,115

PACKAGING

- 1916 NARAYANAN (PV). Corrugated boards for glass packaging. Glass Udyog. 11(3); 1982; 29-35
- 1917 KOTHARI (AJ). Shrink packaging. Glass Udyog. 11(3); 1982; 9-14
- 1918 DOLLGEN (HJ) and DIETRICH (B). Pasteboard box packaging is not that easy. Flussiges Obst. 47(9a); 1980; 474-6 (German)
- 1919 HATZEBRUCH (M). On the design of small crates for carrying bottles. Flussiges Obst. 47(9a); 1980; 484-6 (German)
- 1920 VEERAJU (P) and CROWN (JK). Machine for making high quality leaf dishes. Appropriate Technol. 8(3); 1982; 9-12
The technology has been developed at the Central Food Technological Research Institute for making cups from some special types of leaves. The machine and its working is described along with the cost economics of the machine. KAR
- 1921 MONTE (WC), and WEST (D). Solubility of polystyrene in certain vegetable oils, essential oils, and their constituents. J. Food Sci. 47(6); 1982; 1832-5
Certain food items have been shown to be incompatible with the expanded polystyrene used for the manufacture of food containers. Using ¹⁴C polystyrene (synthesized in such a way as to approximate the structure of commercial polystyrene), it was determined that this incompatibility was due, in part, to the dissolution of polystyrene by certain essential oils. Citronella, limonene and terpinene (constituents of many flavour oils) were found to be excellent solvents for polystyrene, solubilizing almost half a gram per gram of solvent at room temperature. AA
- 1922 TUOMY (JM) and YOUNG (R). Retort-pouch packaging of muscle foods for the armed forces. Food Technol. 36(2); 1982; 68-70
With pouched foods, the pouch had to be developed and perfected first and then the food adjusted to optimize them in the new system. These aspects are covered in this article. KAR

FOOD ENGINEERING AND EQUIPMENT

- 1923 LEE (YH). Pulsed light probe for cell density measurement. Biotechnol. Bioeng. 23(8); 1981; 1903-6
- 1924 SMITH (EA). 3-dimensional analysis of air velocity and pressure in beds of grain and hay. J. Agric. Eng. Res. 27(2); 1982; 101-17
The finite element method using the frontal solution technique

was used to calculate the airflow and pressure distribution in hay and grain beds where these parameters vary significantly in 3 dimensions. This is a larger problem than the 2-dimensional method previously studied and required a more efficient solution technique. The accuracy of the 3-dimensional method was estimated using a simple 1-dimensional test case. A comparison was made between experimental values of pressure and velocity and values calculated using the finite element method. It was found that pressure could be calculated more accurately than velocity but that both could be calculated with reasonable accuracy in practical problems. A technique was developed for studying 3-dimensional on-floor monoduct systems using the finite element method. AA

- 1925 DANG (NDP). Automation in food processing. Now and the future. Food Flavour. Ingrid. Process. Packag. 4(9); 1982; 37,39,41,49
Discusses: what is automation; on-line instrumentation; measuring physical properties; process control; and future and current applications. BSN
- 1926 SHARMA (KP). Quality, reliability and maintenance aspects of modern process control instrumentation. Chem. Age India. 33(1); 1982; 31-5
- 1927 GUARINO (LJ). Application of the refrigeration cycle for distilling liquids compared with conventional evaporators. Ashrae J. 24(2); 1982; 32-6
- 1928 PERDUE (RE) Jr. Field drying plant material collected for chemical and biological screening. I. Portable facility for sun drying. Econ. Bot. 36(4); 1982; 369-72
A 16 x 35 feet tarpaulin supported by rope and posts is used to protect drying plant samples from rain and dew. The tarpaulin can be quickly lowered in place when showers threaten and provide space below for circulation of air. AA
- 1929 CAMPBELL (JK). An uncomplicated solar water heater for the tropics. Appropriate Technol. 8(4); 1982; 25-7
The heater which is in use in Lima, Peru is designed to be inexpensive and easily constructed using simple tools. It is filled with cold water in the morning from which hot water is available during the afternoon and evening. With the heater in Lima, the water reaches a maximum temperature of 57 C at about 5.30 P.M. Water remains hot (above 45 C) until about 8.30 P.M. KAR
- 1930 CLARK (S). A solar food dryer for Bangladesh. Appropriate Technol. 8(4); 1982; 14-6
The technology described here has been applied in Bangladesh as the basis of a rural fruit and vegetable drying industry. The description of the dryer has been given along with illustrations. KAR
- 1931 MORE (PK). The whole reduced mill extraction. Indian Sugar. 31(11); 1982; 773-81
New concepts of reduced mill extraction (RME) is explained in mathematical terms. This takes into account the need for considerations of purity factor of cane and adopted maceration of fibre in arriving at RME. MVG

ENERGY IN FOOD PROCESSING

- 1932 KOPPATSCH (A). Rational utilization of energy for the manufacture of foodstuffs. Lebensmittelindustrie. 27(11); 1980; 489-90 (German)

- 1933 LOOS (J). Saving of energy in food factories. Lebensmittelindustrie. 27(11); 1980; 491-6 (German)
- 1934 KIMENOV (A). Ways to decrease the consumption of energy and fuel in the food industry. Lebensmittelindustrie. 27(11); 1980; 496-8 (German)
- 1935 JUNGE (B). Rational utilization of energy in cold stores. Lebensmittelindustrie. 27(11); 1980; 504-8 (German)
- 1936 DVORAK (Z). Absorption type refrigeration machines and their importance for the saving of energy. Lebensmittelindustrie. 27(11); 1980; 509-12 (German)
- 1937 SCOTT (EP), CARROAD (PA), RUMSEY (TR), HORN (J) BUHLERT (J) and ROSE (WW). Energy consumption in steam blanchers. J. Food Process. Eng. 5(2); 1981; 77-88
The energy consumption of several steam blanchers was monitored to identify design characteristics which are most energy conserving. Hydrostatically sealing the units to prevent escape of steam was shown to be significant in reducing energy usage. Results are compared with estimates of energy efficiency found in the literature and are shown to be in agreement. AA

FOOD CHEMISTRY AND ANALYSIS

- 1938 ANDERSON (CB) and WITTER (LD). Water binding capacity of 22 L-amino acids from water activity 0.33 to 0.95. J. Food Sci. 47(6); 1982; 1952-4
- 1939 MNKENI (AP) and BEVERIDGE (T). Thermal destruction of pteroylglutamic acid in buffer and model food systems. J. Food Sci. 47(6); 1982; 2038-41, 2063
- 1940 DAY (WR). The use of high-performance liquid chromatography in the food industry. Food Technol. Aust. 34(1); 1982; 36-9
Use of HPLC for the separation of macroconstituents of food like peptides, amino acids, lipids, carbohydrates, and microconstituents of food like pigments, odours and flavours, vitamins, anti-oxidants and preservatives, mycotoxins, pesticides and inorganic ions have been described. KAR
- 1941 BAZARD (D), FLAYEUX (R) and MOLL (M). Use of high-performance liquid chromatography in a laboratory of the food industry. Ind. Aliment. Agric. 98(1-2); 1981; 55-61 (French)
High-pressure liquid chromatography can be used in a food industry laboratory for the analysis of: a) fermentable glucides of must; (b) oligosaccharides in a mixture of malto-dextrins; (c) bitter substances of hops and beer; and (d) polyphenols of beer. The analyses take only a short time, and their repeatability is good; some ways of improving the resolving power of this method have been found in the authors' laboratory. KMD
- 1942 RAMSEY (MH) and THOMPSON (M). On-line diluter for atomic-absorption spectrophotometry. Analyst. 107(1271); 1982; 232-4
- 1943 HAYS (GR). High-resolution carbon-13 solid-state nuclear magnetic resonance spectroscopy. Analyst. 107(1272); 1982; 241-52
- 1944 MARR (IL) and ANWAR (J). Micro-determination of tin in organotin compounds by flame-emission and atomic-absorption spectrophotometry. Analyst. 107(1272); 1982; 260-68

- 1945 NKONGE (C) and BALLANCE (GM). A sensitive colorimetric procedure for nitrogen determination in micro-Kjeldahl digests.
J. Agric. Food Chem. 30(3); 1982; 416-20
The need for a sensitive and accurate method for ammonia estimation in micro-Kjeldahl digests led to the reexamination of the optimum conditions of a colorimetric assay based on the Berthelot reaction. The specific procedure involves the reaction of salicylate and hypochlorite with ammonia. A minimum 40% improvement in sensitivity over other colorimetric procedures was achieved by optimization of reagent concentrations, temperature, pH, and incubation time. Comparison of values obtained by this procedure and by titration is in excellent agreement. A scaled-down procedure agreed well with the standard procedure. AA
- 1946 YAMAMOTO (S), ITANO (H), KATAOKA (H) and MAKITA (M). Gas-liquid chromatographic method for analysis of di- and polyamines in foods.
J. Agric. Food Chem. 30(3); 1982; 435-9
A gas-liquid chromatographic method for the quantitative determination of putrescine, cadaverine, spermidine, and spermine in foods has been developed. The amines were separated from foods by eluting through a cation-exchange resin column and then converted to their (ethyloxy) carbonyl derivatives by the reaction with ethyl chloroformate in aqueous medium before application to the gas chromatograph with a flame ionization detector. 1,8-Diaminooctane was used as an internal standard. Separation and determination of the resulting derivatives were performed on a 1.5% SE-30/0.3% SP-1000 on Uniport HP column (0.5 m) under the temperature-programmed condition. The calibration curves for the amines in the range of 12.5-125 nmol were linear and sufficiently reproducible for quantitative determination. The overall recovery rates were satisfactory. Putrescine and spermidine were present in all of the foods investigated. Relatively large amounts of spermidine occurred in the mushrooms and beans investigated. AA
- 1947 KEARSLEY (MW) and THANOS (A). Rapid determination of sulphur dioxide in foods.
J. Assoc. Publ. Anal. 20(4); 1982; 145-52
A rapid method for sulphur dioxide estimation in foods is described. The method uses a compact, semi-automatic distillation apparatus normally used for nitrogen estimation, and gives a much reduced analysis time compared with those of conventional methods, whilst the apparatus design reduces operator attention and error. Typical analysis times are 3 minutes for jams and soft-drinks, and 12 minutes for sausages. AA
- 1948 READ (JI) and COLLINS (R). Estimation of total flouride in foodstuffs.
J. Assoc. Publ. Anal. 20(4); 1982; 109-15
A procedure is described for estimation of total fluoride in foodstuffs for levels down to 0.3 mg/kg. The sample is mixed with a prepared calcium hydroxide, as an ashing additive to immobilise volatile fluoride, and ashed in a stainless-steel lined muffle. Fluoride is separated by steam-distillation from a sulphuric acid medium and collected, when necessary, on an anion-exchange resin. After elution, the fluoride is measured potentiometrically using a fluoride ion-sensitive electrode. Standard deviations of the results for levels normally found in foodstuffs have been calculated and derived confidence intervals are given. AA
- 1949 OTTO (R) and BALTES (W). Model experiments for the Maillard Reaction. III. Volatile products from the reaction of D-Glucose with 4-chloroaniline.
Z. Lebensmittel-Unters. Forsch. 171(4); 1980; 286-91 (German)
- 1950 TANAKA (A), NOSE (N) and IWASAKI (H). Spectrophotometric determination of nitrate in vegetable products using 2-sec-butylphenol.
Analyst. 107(1271); 1982; 190-94

A procedure is described for the determination of nitrate in vegetable products, based on the quantitative reaction of nitrate and 2-See butylphenol in sulphuric acid (5+7), and the subsequent extraction and measurement of the yellow complex formed in alkaline medium. The colour reaction is sensitive and stable and absorbances measured at 418 nm obey Beer's law for concentrations of nitrate-nitrogen between 0.13 and 2.50 $\mu\text{g ml}^{-1}$. Various possible interferents in vegetable products do not interfere with the nitration of 2-See-butylphenol. Recoveries of nitrate from vegetable products were satisfactory and the standard deviation for the whole procedure was 1.41% for the 42 determinations; the detection limit of the method is 1.3 ppm for nitrate-nitrogen. AA

FOOD LAWS AND REGULATIONS

Nil

FOOD MICROBIOLOGY

- 1951 DANIELSON (ND) and SIERGIEJ (RW). Immobilization of enzyme on polytetrafluoroethylene particles packed in HPLC columns. Biotechnol. Bioeng. 23(8); 1981; 1913-7
- 1952 OOSHIMA (H) and HARANO (Y). Effect of intraparticle diffusion resistance on apparent stability of immobilized enzymes. Biotechnol. Bioeng. 23(9); 1981; 1991-2000
- 1953 VALENTOVA (O), MAREK (M), SVEC (F), STAMBERG (J) and VODRAZKA (Z). Comparison of different methods of glucose oxidase immobilization. Biotechnol. Bioeng. 23(9); 1981; 2093-104
- 1954 KELLER (SE), JEN (JJ) and BRUNNER (JR). Purification of commercial pectinase by hydrophobic chromatography. J. Food Sci. 47(6); 1982; 2076-7, 2079
- 1955 SCHAFFER (ML), PEELER (JT), BRADSHAW (JG), HAMILTON (CH) and CARVER (RB). A rapid gas chromatographic method for the identification of sporeformers and nonsporeformers in swollen cans of low-acid foods. J. Food Sci. 47(6); 1982; 2033-7
- A rapid gas-liquid chromatographic method for the identification of sporeformers and nonsporeformers as the probable cause of swollen cans of low-acid foods was developed and evaluated. Cans of five types of food were inoculated with cultures of seven sporeforming organisms and three non-sporeformers. The supernatant from the can content was assayed on two packed columns designed for the assay of aqueous solutions of volatile free acids using flame ionization detectors. A statistical discriminant analysis was conducted on selected peak areas. Overall, 88% of 120 cans were correctly identified in the standard data set and 80% of 110 cans analyzed as unknowns. Sporeformers were detected in 62% of 30 cans inoculated with three mixtures of sporeformers and nonsporeformers. AA
- 1956 JAY (JM). Effect of diacetyl on foodborne microorganisms. J. Food Sci. 47(6); 1982; 1829-31
- 1957 WHITE (TC), HEIDELBAUGH (ND) and McCONNELL (S). Survival of virus after thermoprocessing in capillary tubes. J. Food Process. Preserv. 6(1); 1982; 31-40
- 1958 LUONG (JHT) and VOLESKY (B). A new technique for continuous measurement of the heat of fermentation. European J. Appl. Microbiol. Biotechnol. 16(1); 1982; 28-34

In this system, the fermentation broth was overcooled by a given constant cooling water flow. The excess heat removed from the fermentor was made up by an immersion electrical heater. The action of the temperature controller was precisely monitored as it varied in response to the amount of heat produced by the microbial activities. KAR

- 1959 CHOPRA (CL), QAZI (GN), CHATURVEDI (SK), GAIND (CN) and ATAL (CK). Production of citric acid by submerged fermentation. Effect of medium sterilization at pilot-plant level.
J. Chem. Technol. Biotechnol. 31(2); 1981; 122-6
- 1960 CHEN (SL). Optimization of batch alcoholic fermentation of glucose syrup substrate.
Biotechnol. Bioeng. 23(8); 1981; 1827-36
- 1961 COSTILOW (RN) and UEBERSAX (M). Effects of various treatments on the quality of salt-stock pickles from commercial fermentations purged with air.
J. Food Sci. 47(6); 1982; 1866-8, 1874

YEAST

- 1962 ROTHENBUEHLER (E), AMADO (R) and SOLMS (J). Isolation and identification of amino acid derivatives from yeast.
J. Agric. Food Chem. 30(3); 1982; 439-42
- 1963 NANBA (A), HIROTA (F) and NAGAI (S). Microcomputer-coupled baker's yeast production.
J. Ferment. Technol. 59(5); 1981; 383-9
A simplified microcomputer-aided process capable of providing feed forward and feedback control of sugar feeding based on the output signal of a reliable ethanol sensor has been reported. KAR
- 1964 GIEC (A) and KOSIKOWSKI (FV). Activity of lactose fermenting yeasts in producing biomass from concentrated whey permeates.
J. Food Sci. 47(6); 1982; 1892-1907
- 1965 BARFORD (JP) and HALL (RJ). A mathematical model for the aerobic growth of *Saccharomyces cerevisiae* with a saturated respiratory capacity.
Biotechnol. Bioeng. 23(8); 1981; 1735-62
- 1966 HALL (RJ) and BARFORD (JP). Simulation of the integration of the internal energy metabolism and the cell cycle of *Saccharomyces cerevisiae*.
Biotechnol. Bioeng. 23(8); 1981; 1763-95
- 1967 SCHAFFELD (G), SINSKEY (AJ) and RHA (C). Release of single-cell protein by induced cellolysis.
J. Food Sci. 47(6); 1982; 2072-3
- 1968 WILLIAMS (D) and MUNNECKE (DM). The production of ethanol by immobilized yeast cells.
Biotechnol. Bioeng. 23(8); 1981; 1813-25

ALGAE

- 1969 WATTS PIRT (M) and PIRT (SJ). The chemical nature of algal (chlorella) starch and its estimation in whole cells.
J. Chem. Technol. Biotechnol. 31(3); 1981; 183-8

MUSHROOM

- 1970 LEICHTER (J) and BANDONI (RJ). Nutrient content of mushrooms grown in British Columbia.
Can. Inst. Food Sci. Technol. J. 13(3); 1980; 122-4

- 1971 ROSS (AE), NAGEL (DL) and TOTH (B). Evidence for the occurrence and formation of diazonium ions in the *Agaricus bisporus* mushroom and its extracts.
J. Agric. Food Chem. 30(3); 1982; 521-5
- 1972 DISNEY (RHL). *Megaselia sandhui* sp.n. (Diptera: Phoridae), a pest of cultivated mushrooms in India.
Bull. Entomol. Res. 71(3); 1981; 509-12
- 1973 SIVAPRAKASAM (K). *Pleurotus sajor - caju* as a source of microbial proteins.
Arogya. 8(2); 1982; 140-43

FOOD ADDITIVES

- 1974 POST (FJ) and COLLINS (NF). A preliminary investigation of the membrane lipid of *Halobacterium halobium* as a food additive.
J. Food Biochem. 6(1); 1982; 25-38
- 1975 KENNDLER (E) and HUBER (JFK). Simultaneous identification and quantitation of the food additives glutamate, guanosine 5'-monophosphate and Inosine 5'-monophosphate by isotachopheresis.
Z. Lebensmittel Unters. Forsch. 171(4); 1980; 292-6
The method proposed is characterized by high precision and accuracy, and a detection limit in the ppm range. Sample pretreatment is extremely simple and consists only in one extraction step of the sample with water, followed by separation of the insoluble residue by centrifugation. Further cleanup steps are not required, because there is no interference in the determination even in trace amounts by food constituents. The choice of the electrolyte system allows, in addition, the simultaneous determination of other anionic additives such as preservatives. The detection limit was found to be in the range of 10 µg for all three additives. AA
- 1976 BEUCHAT (LR). Influence of potassium sorbate and sodium benzoate on heat inactivation of *Aspergillus flavus*, *Penicillium puberulum* and *Geotrichum candidum*.
J. Food Prot. 44(6); 1981; 450-4
Viable heated conidia of *A. flavus* and *P. puberulum* had increased sensitivity to potassium sorbate and sodium benzoate, indicating heat injury. However, the relative effects of the two preservatives on colony formation in recovery agar were reversed from those noted in heating media i.e. at comparable concentrations, potassium sorbate was more effective than sodium benzoate for inhibiting colony formation. AA
- 1977 BLOCHER (JC), BUSTA (FF) and SOFOS (JN). Influence of potassium sorbate and pH on ten strains of type A and B *Clostridium botulinum*.
J. Food Sci. 47(6); 1982; 2028-32
- 1978 TAKAHASHI (O) and HIRAGA (HK). Effect of butylated hydroxytoluene on the lipid composition of rat liver.
Toxicology. 22(2); 1981; 161-70
- 1979 DCDSON (AG) and WRIGHT (SJC). The new sweeteners: A confectioner's view point.
Food Flavour. Ingrid. Process. Packag. 4(9); 1982; 29,31-2,59
Discusses: bulk sweeteners; properties of bulk sweeteners; and work at Leather Head Food Laboratories. BSN
- 1980 BERNDT (WO), REDDY (RV) and HAYES (AW). Evaluation of renal function in saccharin treated rats.
Toxicology. 21(4); 1981; 305-16

- 1981 HARPER (R). Art and science in the understanding of flavour. The littlejohn lecture. Part 1. Food Flavour. Ingrid. Process. Pack. 4(1); 1982; 13-5,17,19,21
- 1982 KNIGHTS (J). The flavour industry. Food Flavour. Ingrid. Process. Packag. 4(9); 1982; 20-21,43
Discusses: world market; flavour innovation; positive listing; negative listing; mixed system; process flavours; precursor systems, microbiological and enzyme systems; tissue cultures; and extraction and concentration. BSN
- 1983 HEATH (HB). Emulsifiers and stabilisers in food processing. Food Flavour. Ingrid. Process. Packag. 4(9); 1982; 24-5,27
Discusses: natural emulsifying agents; synthetic emulsifying agents; and specific applications. BSN

CEREALS

- 1984 SINHA (RN). Food losses through energy transfer from cereal grains to stored-product insects. Food Nutr. Bull. 4(2); 1982; 13-20
- 1985 OSBORNE (BG). Mycotoxins and the cereals industry. A review. J. Food Technol. 17(1); 1982; 1-9
Discusses; mycotoxicoses associated with cereals; and formation and occurrence of mycotoxins. BSN

WHEAT

- 1986 BRILLOUET (J-M), JOSELEAU (J-P), UTILLE (J-P) and LELIEVRE (D). Isolation, purification, and characterization of a complex heteroxyran from industrial wheat bran. J. Agric. Food Chem. 30(3); 1982; 488-95
- 1987 VERED (Y), MILSTEIN (O), FLOWERS (HM) and GRESSEL (J). Biodegradation of wheat straw lignocarbhydrate complexes (LCC). I. Dynamics of liberation of hot aqueous LCCs from wheat straw and partial characterization of the products. European J. Appl. Microbiol. Biotechnol. 12(1); 1981; 183-8
- 1988 SINGH (T) and TYAGI (RPS). Studies on quantitative loss of wheat products due to Karnal bunt. Indian Miller. 12(4); 1982; 5-7
Effect of Karnal bunt, a disease caused in wheat by *Neovossia indica* (Mittra) Mundkur, on the hectolitre weight of wheat (WL-711 cv) and yield of wheat meal (Atta) and wheat flour (Maida) has been investigated. The hectolitre weight decreased with increased infection with a maximum weight loss of 29.77%. The yields of atta and maida were also significantly reduced. The samples of sound (uninfected) grains gave 84.5% and 68.6% yields of atta and maida respectively while they were 74% and 46% in the sample having 21% grains infection. Yield of maida was reduced more than that of atta. The maximum weight loss of maida was 33.14%, and atta was 12.3%. A direct correlation was observed between percentage of bunt infected grains and the loss of hectolitre weight and yields of atta and maida. MVG
- 1989 CHAWLA (VK) and KAPOOR (AC). Chemical composition and protein quality of wheat-triticales chapatis. J. Food Sci. 47(6); 1982; 2015-7
Flours of wheat (WH-157) and triticales (TL-183, THS-9, JNK6T-229 and URT-217), and chapatis prepared after substituting different proportions of wheat flour with triticales flours were evaluated for

nutritional quality. Flours of triticale varieties contained higher amounts of protein, crude fibre, total and available lysine, and lower contents of gluten than wheat. Losses of amino acids due to chapati making were negligible. As the proportion of triticale flours in chapatis increased the protein quality of chapatis improved. AA

BARLEY

- 1990 THOMPSON (RG) and LaBERGE (DE). Barley endosperm cell walls: Morphological characteristics and chemical composition. MBAA Techn. Quart. 18(3); 1981; 116-21

MILLETS

SORGHUM

- 1991 DAESCHEL (MA), ORVIN-MUNDT (J) and McCARTY (IE). Microbial changes in sweet sorghum (*Sorghum bicolor*) juices. Appl. Environ. Microbiol. 42(2); 1981; 381-2
 Juice freshly expressed from *Sorghum bicolor* for making sweet sorghum syrup contained 10^8 microorganisms per ml. The dominant bacterium was *Leuconostoc mesenteroides*, followed by gram-negative rods. Lactobacilli, yeasts, and nonfecal coliform bacteria each comprised about 1% of the microbial population. Spoilage of juice, manifested by a sour odour, discolouration, and foaming, occurred between 5 and 12 hours at ambient temperatures. Spoilage was correlated with a drop in pH from 4.9 to 4.5. *L. mesenteroides* was the dominant spoiling agent at 20 C, and *Lactobacillus plantarum* was the dominant spoiling agent at 32 C, as determined by pure culture studies. Juice may be stored for 14 days at 4 C if promptly refrigerated. AA
- 1992 McGRATH (RM), KALUZA (WZ), DAIBER (KH), VAN DER RIET (WB) and GLENNIE (CW). Polyphenols of sorghum grain, their changes during malting, and their inhibitory nature. J. Agric. Food Chem. 30(3); 1982; 450-56
 An automated system for the detection of tannins is described. It uses the precipitation of bovine serum albumin (BSA), and this, in tandem with an automated detection of phenolic groups, has been used for the rapid investigation of four sorghum varieties. Two of the varieties were bird resistant and were distinguishable from the non-bird-resistant grains by the presence of a tannin fraction that precipitates protein. The noninhibiting fraction (F₁) of all four varieties contained a large number of varied phenolics. During malting the roots and shoots developed a large complement of F₁ polyphenols and the properties of the tannins changed. The ability of the grain to resist mold growth is related to polyphenol content; resistance was ascribed to the physical barrier set up by the tannin-containing testa. Formaldehyde treatment of whole grain reduced both the number of available phenolic hydroxyl groups in the tannin and its ability to precipitate BSA. AA
- 1993 NEUCERE (JN). Lectins in grain sorghum (*Sorghum bicolor* (L.) Moench). J. Agric. Food Chem. 30(3); 1982; 603-4

MAIZE

- 1994 WIDSTROM (NW), WILSON (DM) and McMILLIAN (WW). Aflatoxin contamination of preharvest corn as influenced by timing and method of inoculation. Appl. Environ. Microbiol. 42(2); 1981; 249-51

- 1995 SZMANT (HH) and CHUNDURY (DD). The preparation of 5-hydroxymethyl-furfuraldehyde from high fructose corn syrup and other carbohydrates. J. Chem. Technol. Biotechnol. 31(3); 1981; 135-45
5-Hydroxymethylfurfuraldehyde (HMF) was prepared from high fructose corn syrup (HFCS), or crystalline D-fructose, in high yield and purity. A 95-97% conversion of fructose to HMF was achieved using 25 mol% (based on fructose) boron trifluoride etherate catalyst in dimethyl sulphoxide, under a nitrogen atmosphere, a reaction temperature of 273 K and 30 min. reaction time. Inferior yields of HMF were obtained from glucose and starch. AA
- 1996 OWUSU-ANSAH (J), Van de VOORT (FR) and BEDIAKO-AMOA (B). Banku: Its degree of gelatinization and development of a quick cooking product. Can. Inst. Food Sci. Technol. J. 13(3); 1980; 131-4
Banku, a fermented starch-based product, is a popular food in Ghana. It is either prepared exclusively with maize or from a mixture of maize and cassava. The drum dried product was found to offer a means for preparing a quick cooking banku of acceptable quality. The product which has a moisture content of 2-3% may be stored for 1 year, as the product does not show any significant deterioration of its quality parameters. BSN

PULSES

- 1997 BHATTY (RS). Albumin proteins of eight edible grain legume species: Electrophoretic patterns and amino acid composition. J. Agric. Food Chem. 30(3); 1982; 620-22
The albumin protein (AP) content of eight edible grain legume species varied from 8.1 to 14.1% of the meal protein. The AP contained from 9.5 to 12.4% nitrogen, 0.09 to 1.72% phosphorus, and 0.2 to 1.8% starch. Although there were differences in the amino acid composition of the species, the AP contained more tryptophan, lysine, threonine, valine, and methionine but less arginine, leucine, and phenylalanine than the globulin proteins isolated from the same legume species. The AP of mung beans, lentils, faba beans, vetch, dry beans, and peas resolved into 20-25 bands and the AP of lathyrus and chickpeas into 19 bands on sodium dodecyl sulphate-polyacrylamide gel electrophoresis with molecular weights estimated mostly between 10,000 and 100,000. AA
- 1998 DESHPANDE (SS) and SALUNKHE (DK). Interactions of tannic acid and catechin with legume starches. J. Food Sci. 47(6); 1982; 2080-81, 2083
- 1999 REYNOLDS (PA) and KLEIN (BP). Calcium interaction with substrates of type-2 pea lipoxygenases. J. Food Sci. 47(6); 1982; 1999-2003
- 2000 MATTA (NK) and GATEHOUSE (JA). Modification of the basic subunits of pea legumin on storage. Phytochemistry. 20(12); 1981; 2621-3
Basic subunits of legumin of *Pisum sativum* undergo on storage of dry seeds a modification which increases their apparent MW on SDS-polyacrylamide gel electrophoresis and decreases their pI values. AA
- 2001 THIND (BB) and MUGGLETON (J). Inheritance of the ability of strains of *Sitophilus oryzae* (L.) (Coleoptera: Curculionidae) to breed on split-pea (*Pisum sativum*). Bull. Entomol. Res. 71(3); 1981; 419-24

BUTTER BEAN

- 2002 HARAKAWA (M), TSUJI (M) and KOMIYAMA (Y). Analysis of the present process on "Ann" manufacture using beans (Butter bean) containing cyanogenic compounds. Chemical studies on "Ann" manufacture using beans containing cyanogenic compounds. Part I. J. Jpn. Soc. Food Sci. Technol. 28(3); 1981; 119-24 (Japanese)
- The manufacturing process of innocuous "Ann" from beans (Butter bean, *Phaseolus lunatus* Linn) containing cyanogenic compounds was studied. The "Ann" used for the analyses was manufactured in a modern and old factories and the amount of liberated hydrogen cyanide (HCN) in each process was estimated. Liberated HCN in the usual product of "Ann" was not detected by the picric test according to the method of "the Food Hygienic Law" in Japan, but the high amount of HCN was sometimes detected in the "Ann" produced under the conditions in which the boiling or the "Shibukiri" process was imperfect. A part of HCN liberated from beans moved to the waste water, and its amount increased with increasing the temperature of soaking water of the beans. Liberation ratio of HCN in the soaking process was 30.2% in the modern factory and 21.3% in the old factory. ("Ann" ("Nama Ann") is a mashed and granulated product of boiled beans. "Shibukiri" is to remove the lye from beans by boiling). AA
- 2003 HARAKAWA (M), TSUJI (M) and KOMIYAMA (Y). Behaviour of liberated HCN during the laboratory process of "Ann" production using beans containing cyanogenic compounds and the liberation ratio of HCN in soaking process. Chemical studies on "Ann" manufacture using beans containing cyanogenic compounds. Part II. J. Jpn. Soc. Food Sci. Technol. 28(3); 1981; 125-30 (Japanese)
- In order to investigate the behaviour of liberated HCN during the process of "Ann" production, the "Ann" was produced on a laboratory scale. Through this experiment, attempts to increase the liberation ratio of HCN in a soaking process were made. (1) In the laboratory process, almost all amount of HCN was distributed in beans and in soaking water during the soaking process. During the subsequent "Shibukiri" process, 90% of HCN in the beans was vaporized. The liberation of HCN from beans occurred only in the soaking process and its amount was 14.3% of the total HCN which was to be generated from all of the cyanogenic compounds in the beans. (2) The optimum condition for the liberation of HCN in the soaking process was given at 50 C and pH 8.0. It did not occur at 70 C and above. (3) When the commercial enzymes such as cellulase, protease and pectinase containing hemicellulase were added to the soaking water to increase the liberation of HCN, the maximum liberation ratio became 53.3%. (4) The liberation ratio of HCN increased with increasing the ratio of soaking water to beans, and it went up to 50.4% at the water-beans ratio of 4 in case of Butter beans. ("Ann" ("Nama Ann") is a mashed and granulated product of boiled beans. "Shibukiri" is to remove the lye from beans by boiling). AA
- 2004 TSUJI (M), HARAKAWA (M) and KOMIYAMA (Y). Effect of temperature and relative humidity on the moisture content, the rate of water absorption and the liberation ratio of HCN of butter beans containing cyanogenic compounds during storage. J. Jpn. Soc. Food Sci. Technol. 28(3); 1981; 157-9 (Japanese)
- The moisture content, the rate of water absorption and the liberation ratio of HCN of Butter beans (*Phaseolus lunatus* L.) were measured after storing at various temperatures and relative humidities (R.H.). The controlled temperature at 15 C and R.H. at 65% were necessary for keeping or promoting the values of such qualities. The higher or lower temperature and humidity in storage than those mentioned above gave the lower values of estimation for the qualities except for the moisture content. The rate of water absorption showed the same value as estimated at the beginning of storage when beans were soaked for a longer time, while beans stored at 50 C and 20% R.H. could not recover the rate of water absorption as much as the beginning. When beans were

stored at 30 C and 85% R.H., the moisture content increased, and the quality deteriorated due to growing of mold on surface. AA

DRY BEAN

- 2005 DESHPANDE (SS), SATHE (SK), SALUNKHE (DK) and CORNFORTH (DP). Effects of dehulling on phytic acid, polyphenols, and enzyme inhibitors of dry beans (*Phaseolus vulgaris* L.).

J. Food Sci. 47(6); 1982; 1846-50

Effects of dehulling on phytic acid; trypsin, chymotrypsin, and α -amylase inhibitory activities and tannins of ten cultivars of dry beans (*Phaseolus vulgaris* L.) were investigated. Phytic acid content of whole beans ranged from 1.16-2.93%. Dehulling significantly increased the phytic acid content of beans (range 1.63-3.67%). Dehulling also increased trypsin, chymotrypsin, and α -amylase inhibitory activities of the beans. Tannin contents of whole and dehulled beans ranged from 33.7-282.8 and 10.0-28.7 mg catechin equivalents/100g beans, respectively. Removal of seed coats lowered the tannin content of beans by 68-95%. Tannins were not detected in white seeded cultivars of Sanilac, Great Northern, and Small White. Dehulling significantly improved the *in vitro* digestibility of bean proteins. AA

FIELD BEAN

- 2006 KANAMORI (M), IKEUCHI (T), IBUKI (F), KOTARU (M) and KAN (KK). Amino acid composition of protein fractions extracted from *Phaseolus* beans and the field bean (*Vicia faba* L.).

J. Food Sci. 47(6); 1982; 1991-4

Protein fractions were extracted sequentially with 2% sodium chloride, 30% isopropyl alcohol, 4% lactic acid and 0.5% potassium hydroxide from three varieties of adzuki beans, kafee and red kafee bean, three varieties of lima beans and red lima bean, two varieties of kidney beans and field bean that were grown in the tropics and sub-tropics. The sodium chloride extract had the highest range of protein concentration (51.2 to 81.4%). The sodium chloride extract was separated into two fractions based on solubility in water. The amino acid compositions of the flour from the seed and of the two fractions from the sodium chloride extract were determined. High contents of lysine, aspartic acid, glutamic acid and leucine were obtained, whereas the sulphur-containing amino acids contents were low. AA

LIMA BEAN

- 2007 MEREDITH (FI) and THOMAS (CA). Amino acid and elemental contents of lima bean seed.

J. Food Sci. 47(6); 1982; 2021-4, 2061

MUNG BEAN

- 2008 SHEHATA (AAY) and THANNOUN (AM). Chemical and amino acid composition of Iraqi mung beans.

Z. Lebensmittel. Unters. Forsch. 171(5); 1980; 360-2

The chemical composition as well as amino acid contents of five samples of Iraqi mung beans chosen from different geographical regions were investigated. The results indicated that all the samples were good sources of protein, carbohydrates and minerals. They contained 24.95-28.04% protein, 64.15-66.32% carbohydrates, 0.86-0.96% crude fat, 3.37-4.05% ash, and 4.13-5.01% crude fibre. The amounts of phosphorus, calcium and iron were within the ranges; 381-528, 128-143 and 5.14-5.76 mg per 100 gms of flour respectively (all results on a dry weight basis). Further all samples were rich in most essential amino acids

especially, lysine (5.85-8.24 gms per 100 gms of protein), but they were deficient in methionine (0.96-1.48 gm per 100 gms of protein). AA

SNAP BEAN

- 2009 BASEL (RM). Acidified bulk storage of snap beans and peas. J. Food Sci. 47(6); 1982; 2082-3

Peas and snap beans that were stored by acidified storage at a pH of 1.2-1.6 with hydrochloric acid for 4 months had good quality. Blanched peas and snap beans had better quality than unblanched products. Blanching prevented the leaching of starch in the case of peas and pectin in the case of snap beans. The cultivar "Sugar Grey Sugar" after acidification changed colour from green to red due to the presence of leucoanthocyanins. Therefore, 'Sugar Grey Sugar' would not be suitable for this kind of storage. Acidified storage does not employ heat treatment to kill microorganisms or inactivate enzymes. Acidified storage is one possible intermediate storage technique to delay final processing of snap beans and peas. AA

WINGED BEAN

- 2010 KADAM (SS), KUTE (LS), LAWANDE (KM) and SALUNKHE (DK). Changes in chemical composition of winged bean (*Psophocarpus tetragonolobus* L.) during seed development. J. Food Sci. 47(6); 1982; 2051-3, 2057

Three cultivars of winged bean were analyzed for total dry matter crude fat, nitrogenous constituents, phosphorus, calcium, magnesium, zinc, iron, copper and cooking behaviour at different stages of seed maturity. Accumulation of dry matter, crude fat and nitrogen occurred during seed development whereas nonprotein nitrogen and tryptophan contents decreased significantly. Reduction in polyphenol content was observed at all the stages of seed development. There was a significant decrease in total phosphorus content with concomitant increase in the proportion of phytate phosphorus throughout the seed development. In matured seeds, phytate phosphorus accounted for 66-73% of total phosphorus. A reduction in zinc content was noticed in all the cultivars studied. In contrast, calcium, magnesium, iron and copper contents of seeds of different stages of maturity did not exhibit marked differences. AA

OILSEEDS AND NUTS

- 2011 MACLEOD (AJ), PANESAR (SS) and GIL (V). Thermal degradation of glucosinolates. Phytochemistry. 20(5); 1981; 977-80

COTTONSEED

- 2012 CHOI (YR), LUSAS (EW) and RHEE (KC). Effect of succinylation of cottonseed flour during protein extraction on the yield and some of the properties of protein isolates. J. Am. Oil Chem. Soc. 58(12); 1981; 1044-50

GROUNDNUT

- 2013 RAO (VM). Marketing of groundnut. Indian Farm. 32(2); 1982; 13-4
The survey conducted in Machalipatnam Taluk of Andhra Pradesh among the marginal, small, medium and large groundnut growing farmers gives

details of the market surplus available with each category of farmer, marketing cost including transportation, grading, weighment, loading and unloading, taxes and others. It also further illustrates how farmers get market information and it is significant to note that although the farmers have knowledge of the prices prevailing in the market, yet due to the non-availability of transportation, storage and credit facilities they are not getting the real price for their produce. KAR

LUPIN

- 2014 FLEETWOOD (TG) and HUDSON (BJF). Lupinseed. A new source of edible oil.
J. Food Technol. 17(1); 1982; 11-7

SOYABEAN

- 2015 FUSE (T) and YAMAGUCHI (N). Increase of viscosity of the liquid part of canned cooked soyabean and its prevention.
J. Jpn. Soc. Food Sci. Technol. 28(3); 1981; 113-8 (Japanese)
The viscosity of the liquid part of cooked soyabean with sodium chloride and citric acid was investigated. (1) The viscosity of the liquid increased first with increase of the soluble protein from soyabean at the initial step of preservation period, and then by gelatinization of the protein. (2) Although dissolution of soyabean protein was promoted by adding sodium chloride, the viscosity of the solution decreased with increase of the salt concentration in the range of 0.5 ~ 3.0%. (3) The viscosity of the seasoned liquid was decreased by the addition of magnesium and calcium salt, and kept stable during the preservation period suggesting interactions between soyabean protein and the salts were taken place. AA
- 2016 PHILLIPS (DV), DOUGHERTY (DE) and SMITH (AE). Cyclitols in soyabean.
J. Agric. Food Chem. 30(3); 1982; 456-8
- 2017 HAQUE (Z), MATOBA (T) and KITO (M). Incorporation of fatty acid into food protein: Palmitoyl soyabean glycinin.
J. Agric. Food Chem. 30(3); 1982; 481-6
- 2018 CRUZ (R) and PARK (YK). Production of fungal α -galactosidase and its application to the hydrolysis of galactooligosaccharides in soyabean milk.
J. Food Sci. 47(6); 1982; 1973-5
- 2019 PENG (IC), DAYTON (WR), QUASS (DW) and ALLEN (CE). Investigations of soyabean 11S protein and myosin interaction by solubility, turbidity and titration studies.
J. Food Sci. 47(6); 1982; 1976-83
- 2020 PENG (IC), DAYTON (WR), QUASS (DW) and ALLEN (CE). Studies on the subunits involved in the interaction of soyabean 11S protein and myosin.
J. Food Sci. 47(6); 1982; 1984-90, 1994
- 2021 BRESNAHAN (DP), WOLF (JC) and THOMPSON (DR). Potential for utilizing 11S soy globular protein to study texture formation.
J. Food Process. Eng. 5(2); 1981; 113-23
A corn meal based model food system was successfully utilized in experiments designed to measure the influence of protein type on product integrity. The food systems were processed using either a capillary rheometer or an extrusion capillary rheometer to produce the texturized product. The Warner-Bratzler Shear test and the Ottawa texture measuring tests were utilized to indicate product integrity. The purified 11S soy protein produced a product with greater integrity as

measured by maximum shear value than an equivalent amount of soy protein isolate from which it was derived. AA

- 2022 YAMANO (Y), MIKI (E) and FUKUI (Y). Effect of palm oil on the texture of soyabean protein gel.
J. Jpn. Soc. Food Sci. Technol. 28(3); 1981; 131-5 (Japanese)
The texture of soyabean protein gel (bean curd) to which palm oil powder was added, has been investigated by using a texturometer and a rheometer (food elongating-compressing tester). Hardness of the gels increased almost linearly with the increasing amount of added palm oil as determined by both a 18 ϕ cylindrical lucite plunger (texturometer) and a 15 ϕ disk plunger (rheometer). There was a positive relationship between the hardness values of the gels evaluated by texturometry and those obtained by the organoleptic method. A positive relation was also obtained between the flavour and the oil content. The viscosity of soy milk increased sigmoidally with heating time at 50 C and its increasing rate was reduced by the addition of the oil. Higher the oil amount added, lower the gelling rate of soy milk was observed, when the soy milk was heated at 85 C with glucono- δ -lactone as a coagulant. The value of pH of soy milk lowered immediately after heating and no further change occurred by additional heating. It is considered that powdered palm oil delays gelation of soy milk in the presence of glucono- δ -lactone, providing the fine and hard gel structure. AA
- 2023 YAMANO (Y), MIKI (E) and FUKUI (Y). Incorporation of lipid into soyabean protein gel and the role of 11S and 7S proteins.
J. Jpn. Soc. Food Sci. Technol. 28(3); 1981; 136-41 (Japanese)
Incorporation of palm oil into soyabean protein gel and the role of 11S and 7S proteins in gel formation have been investigated. Powdered palm oil was incorporated into the gel completely on its addition up to 10% of the soy milk, and on above 20% addition about 70% of the oil added was incorporated. Microscopic observation of the gel showed that the size of lipid globule in the gel became larger as the oil content increased, and the oil dispersed heterogeneously by addition over 10% oil. The amount of lipid extracted from the gel by γ -hexane and petroleum ether under a fixed extraction conditions increased linearly with increasing oil content, but extractability decreased with increasing oil content. The increasing ratio of hardness with an increase of the oil content in the whole soyabean protein gel was larger than that in the defatted soyabean protein gel. Water-holding capacity of both whole and defatted soyabean protein gels increased with the oil content. The 11S protein apparently plays the main role in the formation of oil-added gel, but from the experiments on gelation of 11S protein, 7S protein and palm oil mixtures, the relative amounts of 7S protein and palm oil to a 11S protein amount were shown to affect fairly the texture of the gels. AA
- 2024 HILL (BS), SNYDER (HE) and WIESE (KL). Use of the pH stat to evaluate trypsin inhibitor and tryptic proteolysis of soy flours.
J. Food Sci. 47(6); 1982; 2018-2020, 2059
Heated soy flours have been analyzed by the pH stat successfully for tryptic proteolysis and for residual trypsin inhibitor in previous studies. Unheated soy flours give a sudden release of hydrogen ion followed by a constantly decreasing proteolysis rate and consequently are difficult to analyze. We have found that by adjusting the pH of the trypsin preparation to 9 (the pH of the analysis), the pH stat method measured proteolysis and trypsin inhibitor in unheated soy flours. The unheated soy protein was hydrolyzed at 40% of the rate of heated soy protein and contained 68 mg/g of Kunitz trypsin inhibitor equivalents.
AA
- 2025 MANORAMA (R) and SAROJINI (G). Effect of different heat treatments on the trypsin inhibitor activity of soyabeans.
Indian J. Nutr. Dietet. 19(1); 1982, 8-13

Four varieties of soyabeans (*Glycine max*) (Ankur, Bragg, Hardee and UPSS-38) subjected to five different heat treatments (i) puffing in sand at 250 C for 3 minutes (ii) roasting in a pan for 3,6,9 and 12 minutes at 85 to 95 C, (iii) soaking in water for 20 hours and boiling for 10, 20,30,40 and 60 minutes, (iv) boiling in water for 10,20,30,40 and 60 minutes and (v) soaked in water for 20 hours and steamed under 15 lb pressure in a pressure cooker for 5,10,15,20 and 30 minutes were examined for their trypsin inhibitor activity. (v) was found to be the best, followed by (iv), (i) and (ii) for inactivation of trypsin inhibitor activity. Acid (boiling with tamarind at 100 C for 30 minutes) and alkali treatment (boiling with sodium bicarbonate at 100 C for 20 minutes) were also found to be effective for inactivation of the trypsin inhibitor. Soaking enabled faster inactivation in all the moist heat treatments. When 'dosa' and 'vada' were prepared from raw soyabean flour, trypsin inhibitor activity was completely destroyed, whereas in case of 'chapati', 'poories' and 'pakoda', the retention was 42.98%, 33.88% and 15.96% respectively. BSN

- 2026 ROBBINS (KR) and BALLEW (JE). Effect of alkaline treatment of soy protein on sulphur amino acid bioavailability.
J. Food Sci. 47(6); 1982; 2070-71

- 2027 HITZMAN (JW), NELSON (AI) and WEI (LS). Effect of added oil on soy beverage quality.
J. Food Sci. 47(6); 1982; 2064-5

Soy beverages, differing significantly in chalkiness, were formulated to contain one of three partially hydrogenated oils. Taste panel studies indicate that beverages containing 2% added oil were less chalky than control samples. In all beverages no single oil was overwhelmingly preferred. All products containing oil supplements were judged to be whiter than control samples and this finding was supported by objective colour determinations. Addition of corn oil to sterilized soy beverages that were significantly different regarding chalkiness tended to reduce differences, and in some cases the quality difference in the various products became statistically indistinguishable. AA

- 2028 MOULTON (KJ), MUSTAKAS (GC) and BAKER (EC). Desolventizing-toasting of extracted soyabean flakes: Development of pilot plant equipment and operational procedure.
J. Am. Oil Chem. Soc. 58(12); 1981; 1041-4
- 2029 PFLUG (IJ), SMITH (GM) and CHRISTENSEN (R). Effect of soyabean casein digest agar lot on number of *Bacillus stearothermophilus* spores recovered.
Appl. Environ. Microbiol. 42(2); 1981; 226-30

RAPSEED

- 2030 SIY (RD) and TALBOT (FDF). Preparation of low-phytate rapeseed protein by ultrafiltration: II. Membrane development and testing.
J. Am. Oil Chem. Soc. 58(12); 1981; 1021-3
- 2031 MAHESHWARI (PN), STANLEY (DW) and GRAY (JI). Detoxification of rapeseed products.
J. Food Prot. 44(6); 1981; 459-70

Reviews the development of low erucic acid rapeseed, and the extensive experimental scrutiny to which this oil has been subjected. The significance of the presence of glucosinolates as well as their decomposition products (isothiocyanates and oxazolidinethiones) in rapeseed meal is also discussed. Various methods for removing these toxic constituents from the meal are reviewed. AA

TUBERS AND VEGETABLES

- 2032 MARTIN-VILLA (C), VIDAL-VALVERDE (C) and ROJAS-HIDALGO (E). High performance liquid chromatographic determination of carbohydrates in raw and cooked vegetables.

J. Food Sci. 47(6); 1982; 2086-8

The soluble sugar contents of 17 raw and cooked vegetables were determined by TLC and HPLC. In general, the soluble carbohydrate content of vegetables is low. For raw materials the highest content was found in carrot, red cabbage, egg plant, green bean and leek. Upon cooking the glucose, fructose and total sugar contents decrease and this diminution is more drastic in the case of frying. The amount of sucrose, except in the case of carrot, egg plant and green bean, increases with cooking. The maltose content of the broad bean increases in the culinary process. AA

- 2033 BAKER (PG) and BOTTOMLEY (P). Determination of residues of synthetic pyrethroids in fruit and vegetables by gas-liquid and high-performance liquid chromatography.

Analyst. 107(1271); 1982; 206-12

A multi-residue method for the determination of synthetic pyrethroids in fruit and vegetables is presented. After extraction with hexane-acetone, the pyrethroids are separated from co-extractives by a partition process and chromatography on a silica gel column and quantitatively determined by electron-capture gas-liquid chromatography and/or high-performance liquid chromatography using an ultraviolet spectrophotometric detector. AA

- 2034 KARANTH (NGK), SRIMATHI (MS) and MAJUMDER (SK). A chromogenic paper for ultra rapid and detection of organochlorine insecticide residues in vegetables.

Bull. Environ. Contam. Toxicol. 28(2); 1982; 221-4

Several batches of market samples of vegetables (Amaranthus, chilli, Lady's finger, squash, beet root, potato) suspected to contain pesticide residues were analysed employing the one-step chromogenic paper method. It was found that the results compared favourable with data obtained from a TLC method. The quick (one minute) method enables detection of pesticide residues in the range of 0-10 ppm. No clean-up procedure, equipment and technical personnel are required for conducting the test. BSN

- 2035 CHAKRABARTI (S), BAGCHI (DK) and MATAI (S). Leaf protein concentrates (LPC) from some water weeds and their lipid contents.

Indian J. Nutr. Diet. 19(4); 1982; 125-7

The polar, non-polar and total lipids in chloroplastic cytoplasmic and unfractionated samples of leaf protein concentrate from *Eichhornia crassipes*, *Limnanthemum cristatum* and *Ipomea reptans* weeds are given. BSN

BEET

- 2036 BLOCK (JE), AMUNDSON (CH) and VON ELBE (JH). Energy requirements of beet colorant production.

J. Food Process. Eng. 5(2); 1981; 67-75

Energy requirements were monitored during the production of a beet colorant on a pilot plant scale. Colorant production involved centrifugation, concentration by fermentation, vacuum concentration, and spray drying. The economic feasibility of adding the fermentation operation to the present extraction and concentration operations was studied. Data were obtained on the production rate, pigment recovery, energy consumption (electrical, steam, gas), and pigment concentration at each unit operation. Calculations were based on a ton of raw beets processed.

Energy costs were \$15.57 per ton. The final spray dried colorant contained between 3 and 5% pigment depending on raw product quality. By-products of yeast and alcohol helped to offset 16% of the energy and raw product costs. AA

TURNIP

- 2037 HASHIMOTO (S), MIYAZAWA (M) and KAMEOKA (H). Volatile flavour, sulphur and nitrogen constituents of *Brassica rapa* L.
J. Food Sci. 47(6); 1982; 2084-5, 1088

CARROT

- 2038 ARYA (SS), NATESAN (V), PREMAVALLI (KS) and VIJAYARAGHAVAN (PK). Effect of pre-freezing on the stability of carotenoids in unblanched air-dried carrots.

J. Food Technol. 17(1); 1982; 109-13

Freezing before conventional hot-air drying considerably improved the stability of carotenoids and lipids in dehydrated carrots. Freezing, however, did not influence the peroxidase activity, glycine, alanine, glutamic acid, aspartic acid, arginine and serine exhibited pro-oxidant effect while threonine and valine did not have a significant effect on β -carotene stability. Histidine, leucine, isoleucine, tryptophan, ascorbic acid and quercetin exhibited antioxidant effect on β -carotene degradation. AA

- 2039 IVIE (WG), BEIER (RC) and HOLT (DL). Analysis of the garden carrot (*Daucus carota* L.) for linear furocoumarins (*Psoralens*) at the sub parts per million level.

J. Agric. Food Chem. 30(3); 1982; 413-16

POTATO

- 2040 MUIR (AY), PORTEOUS (RL) and WASTIE (RL). Experiments in the detection of incipient diseases in potato tubers by optical methods.

J. Agric. Eng. Res. 27(2); 1982; 131-8

Measurements of the diffuse optical reflectance of potato tubers in the visible and near-infrared bands have been analysed in an attempt to detect the presence of diseases before their effects become visible to the eye. The results, while not conclusive, tend to support the feasibility of this approach. AA

- 2041 MAZZA (G). Moisture sorption isotherms of potato slices.

J. Food Technol. 17(1); 1982; 47-54

Water vapour sorption isotherms of Norchip, Russet Burbank and Norland potatoes were determined by the salt solution technique at 10, 25 and 40 C. The adsorption isotherms of potatoes were of sigmoid shape and were affected by drying method, temperature and sugars addition. The freeze dried products adsorbed more water vapour than the vacuum dried materials. Addition of glucose, sucrose or lactose to the potatoes caused the equilibrium moisture content to decrease in the low and intermediate water activity ranges. The sorption was temperature independent in the a_w range 0.11-0.35 and showed a hysteresis loop at intermediate moisture levels. AA

- 2042 JOHNSTON (DE) and OLIVER (WT). The influence of cooking technique on dietary fibre of boiled potato.

J. Food Technol. 17(1); 1982; 99-107

Samples of twenty-five different cultivars of potatoes were examined after cooking by boiling and by pressure cooking, peeled and in the jacket in a factorial design to study the effect of cooking on dietary fibre fractions of potatoes. The samples were analysed for acid detergent

fibre (ADF) and lignin by published procedures. Filtration problems were encountered with the published procedure for neutral detergent fibre (NDF) giving rise to lack of reproducibility. Reproducibility was restored by introducing a short incubation of the same with α -amylase enzyme (*Bacillus subtilis*) prior to the normal detergent digestion. The lignin content of all samples was $<0.25\%$ on a dry matter basis. Both ADF and NDF increased on cooking but boiled samples did not differ from pressure cooked samples. Cooking 'in the jacket' gave higher ADF values than peeled samples but the effect was not observed for NDF values. Cultivar differences were significant for both ADF and NDF values but as the samples were all from a single season's crop in a single field a definitive ranking is not possible. AA

SWEET POTATO

- 2043 BUESCHER (RW) and BALMOORI (MR). Mechanism of hardcore formation in chill-injured sweet potato (*Ipomoea Batatas*) roots. J. Food Biochem. 6(1); 1982; 1-11

- 2044 PURCELL (AE) and WALTER (WM) Jr. Stability of amino acids during cooking and processing of sweet potatoes. J. Agric. Food Chem. 30(3); 1982; 443-4

Changes in the amino acid content of jewel sweet potato were related to the heat processing treatment. Baking the roots caused more loss than either canning in syrup or dehydrating into flakes. The major nutritional change caused by heat processing was lysine destruction, which was significantly greater for canning and dehydration than for baking. Roots canned in syrup contained significantly less nitrogen than roots processed by other treatments. AA

- 2045 HOYASHI (T) and KAWASHIMA (K). Accumulation of sucrose in gamma-irradiated sweet potato roots. J. Food Sci. 47(6); 1982; 2011-4

The effect of storage conditions on the sucrose content of gamma-irradiated sweet potato roots was studied. The sucrose content was influenced mainly by the temperature and oxygen content of the atmosphere. The degree of sucrose accumulation decreased, as the oxygen content of the atmosphere was reduced, while it increased with increase of temperature. The best conditions for the accumulation of sucrose were an irradiation dose of 1 kGy and a storage temperature of 30 C. The sucrose content of the roots which were irradiated and stored under the above conditions exceeded 12% on a fresh weight basis. AA

- 2046 SVENDSBY (O), KAKUTANI (K), MATSUMURA (Y), LIZUKA (M) and YAMAMOTO (T). Ethanol fermentation of uncooked sweet potato with the application of enzymes. J. Ferment. Technol. 59(6); 1981; 485-7

Potato tubers were sterilized with acid, minced and incubated at room temperature with enzymes (glucoamylase, pectin deploymerase, both independently and combined) and yeast. The ethanol produced after 5 days of incubation was estimated to be 100 g by weight per kg potato tubers. Pectin deploymerase allowed glucoamylase to act easily on starch by reducing the viscosity of the incubation mesh. KAR

CASSAVA

- 2047 IGBEKA (JC). Simulation of moisture movement during drying a starchy food product, cassava. J. Food Technol. 17(1); 1982; 27-36

A mathematical model of the moisture transfer in cassava during drying was developed. The model took into account the dependence of moisture diffusivity on moisture content and temperature and was therefore not made a constant. The solution of the model was achieved by an IBM 360 digital computer which utilized the statement oriented 360 CSMP

(Continuous Systems Modelling Program). The predicted moisture profiles were compared with experimental data. The correlation coefficients between the predicted and experimental values ranged between 0.97 and 0.99. The mechanism of moisture transfer was analyzed. AA

JERUSALEM ARTICHOKE

- 2048 GUIRAUD (JP) and GALZY (P). Production of fructose by chemical hydrolysis of inulin.

Ind. Aliment. Agric. 98(1-2); 1981; 45-52 (French)

Extracts from the Jerusalem artichoke and chicory can be hydrolysed totally with a mineral acid (pH 2.0, temp. 110 C, 30 min.). The brown-coloured hydrolysate is then passed over active carbon and ion-exchange resins and concentrated. One obtains 70°Brix syrup containing 97% sugars; 75% of the sugar is fructose, and 25% glucose. This extract had a pale yellow colour. The process is troublesome and, hence, expensive; but the 75% fructose syrup obtained can be used in the same way as isomerase, in many food preparations. KMD

YAM

- 2049 ANOSIKE (EO) and AYAEBENE (AO). Purification and some properties of polyphenol oxidase from the yam tubers, *Dioscorea bulbifera*.
Phytochemistry. 20(12); 1981; 2625-8

AMARANTH

- 2050 HILL (RM) and RAWATE (PD). Evaluation of food potential, some toxicological aspects, and preparation of a protein isolate from the aerial part of amaranth (pigweed).
J. Agric. Food Chem. 30(3); 1982; 465-9

SPINACH

- 2051 LAJOLO (FM) and MARQUEZ (LUM). Chlorophyll degradation in a spinach system at a low and intermediate water activities.
J. Food Sci. 47(6); 1982; 1995-8, 2003

TOMATO

- 2052 DIVITO (AM), SAPERS (GM) and PHILLIPS (JG). Acidification requirements for home canned combinations of tomatoes and low-acid ingredients.
J. Food Sci. 47(6); 1982; 2089-90

Alternative methods of estimating acidification requirements for home canned high-acid foods comprising combinations of tomatoes with low-acid ingredients were compared with forty representative products. Acidification estimates were based on recipe specifications, titration data, predictions made with a regression equation derived from a quadratic model, and predictions derived from a worst case analysis of the model. The last method resulted in satisfactory pH reductions (0.2-0.3 unit) even with products having pH values close to 4.6. Acidification recommendations based on the worst case analysis are given for eight categories of high-acid combination products. AA

- 2053 PRESSEY (R) and AVANTS (JK). Solubilization of cell walls by tomato polygalacturonases: Effects of pectinesterases.
J. Food Biochem. 6(1); 1982; 57-74

- 2054 DALE (MC), OKOS (MR) and NELSON (P). Concentration of tomato products: Analysis of energy saving process alternatives.
J. Food Sci. 47(6); 1982; 1853-8

Four process alternatives to the standard steam driven triple effect scraped surface evaporators are compared on a present value economic basis. Use of mechanical vapour recompression (MVR) evaporators, reverse osmosis (RO), and centrifugal separation of tomato fiber and serum are compared in different combinations. The lowest cost system was found to utilize centrifugation, RO, MVR and heat recovery with a total energy use of 88.7 Kcal/kg (160 Btu/lb) of tomato concentrate as compared to the conventional system requiring over 1110 Kcal/kg (2000 Btu/lb) concentrate. The viscosity of the recombined solids-serum concentrate after a heat treatment was found to be 80% of the conventional concentrate. Mathematical models of the unit operations are developed and coupled with capital costs and energy costs for the unit operations to give present value system costs. AA

CHILLI

- 2055 McLEOD (MJ), GUTTMAN (SI) and ESHBAUGH (WH). Early evolution of chilli peppers (*Capsicum*).

Econ. Bot. 36(4); 1982; 361-8

An hypothesis is advanced based upon geographical information and data from horizontal starch gel electrophoresis regarding the place and mode of evolution of the chilli peppers (*Capsicum*). The hypothesis suggests that a major portion of the genus *Capsicum* arose in a nuclear area in south central Bolivia with subsequent migration into the Andes and lowland Amazonia accompanied by radiation and speciation. AA

CUCUMBER

- 2056 McFEETERS (RF), FLEMING (HP) and THOMPSON (RL). Malic and citric acids in pickling cucumbers.

J. Food Sci. 47(6); 1982; 1859-61, 1865

- 2057 McFEETERS (RF), FLEMING (HP) and THOMPSON (RL). Malic acid as a source of carbon dioxide in cucumber juice fermentations.

J. Food Sci. 47(6); 1982; 1862-5

PUMPKIN

- 2058 WYATT (CJ) and GUY (VH). Growth of *Salmonella typhimurium* and *Staphylococcus aureus* in retail pumpkin pies.

J. Food Prot. 44(6); 1981; 418-21

- 2059 WYATT (CJ) and GUY (VH). Incidence and growth of *Bacillus cereus* in retail pumpkin pies.

J. Food Prot. 44(6); 1981; 422-4

BUFFALO GOURD

- 2060 KHOURY (NN), DAGHER (S) and SAWAYA (W). Chemical and physical characteristics, fatty acid composition and toxicity of buffalo gourd oil, *Cucurbita foetidissima*.

J. Food Technol. 17(1); 1982; 19-26

FRUITS

- 2061 RAMASWAMY (HS) and RICHARDS (JF). A reflectance method to study the green-yellow changes in fruits and vegetables.

Can. Inst. Food Sci. Technol. J. 13(3); 1980; 107-11

A simple reflectance measurement method has been developed to study

the changes in the green colour of fruits and vegetables. Green peas and corn were blended in different proportions to obtain a series with varying greenness. Single point reflectance at wavelengths 440, 550 or 660 nm, on a logarithmic scale, gave a high degree of correlation with visual ranking (0.9613 to 0.9901), chlorophyll content (0.9289 to 0.9954), the Hunter values: L(0.9828 to 0.9920), a (0.8638 to 0.9816), b (0.9441 to 0.9964), and the colour difference, ΔE (0.9533 to 0.9985). Results of application of the method to changes in the colour of ripening bananas and maturing peas are discussed. AA

- 2062 KANE (O), BOULET (M), CASTAIGNE (F) and MARCELLIN (P). A simple atmosphere generating system for experimental storage of fruits and vegetables.
J. Food Sci. 47(6); 1982; 2097-8
- 2063 VIDAL-VALVERDE (C), HERRANZ (J), BLANCO (I) and ROJAS-HIDALGO (E). Dietary fiber in Spanish fruits.
J. Food Sci. 47(6); 1982; 1840-45

DATE

- 2064 SOOD (DR), WAGLE (DS) and DHINDSA (KS). Compositional variations in dried date palm fruit varieties (*Phoenix dactylifera*).
Indian J. Nutr. Dietet. 19(5); 1982; 146-8
- The dried fruits of three date palm cv. (Hayani, Khudrawi and Shamran) were evaluated for chemical composition. The edible portion ranged from 82.80 to 86.72%, total acidity from 17.85 to 20.81 ml, 0.1 N NaOH protein from 0.91 to 1.62% fat from 0.10 to 0.19%, mineral matter from 0.70 to 0.82%, total carbohydrates from 21.40 to 23.79%, total sugars from 25.64 to 27.10%, reducing sugars from 12.59 to 18.83%; non-reducing sugars from 6.81 to 13.84%; Ca from 94.0 to 255.0 mg/100 g; P. from 11.0 to 16.0 mg/100 g; Fe from 0.30 to 0.87 mg/100 g; S from 58.0 to 63.0 mg/100 g; vitamin C from 7.10 to 7.40 mg/100 g and caloric value from 90.95 to 100.63 kcal/100 g. The Hayani dates were found to be superior to Khudrawi and Shamran in protein, reducing sugars, Ca, Fe, ascorbic acid and energy content. BSN

STRAWBERRY

- 2065 STANLEY (R). Perfecting the processed strawberry.
Food Flavour. Ingrid. Process. Packag. 4(9); 1982; 42-3

GOOSEBERRY

- 2066 SADASIVAN NAIR and MOHANLAL JAIN. A pricking machine for Aonla preserve.
Indian Hortic. 27(2); 1982; 17-9
- A hand-operated machine comprising mild steel, stainless steel, Al and wood has been fabricated for pricking of Indian gooseberry in preparing preserves (aonla-murabba). This helps to reduce the spoilage in preserve caused by improper pricking by traditional methods. The machine pricks 80 kg of gooseberry in 8 hours as against 16 kg done by hand, and costs approximately Rs. 500 to fabricate one machine. MVG

SAPODILLA

- 2067 MacLEOD (AJ) and DE TROCONIS (NG). Volatile flavour components of sapodilla fruit (*Achras sapota* L.)
J. Agric. Food Chem. 30(3); 1982; 515-7
- An essence of fresh sapodilla fruit was obtained by well-established procedures, and it possessed the characteristic aroma of the

fruit. It was analyzed by GC-MS with both EI and CI techniques. The fruit produced a relatively small quantity of aroma volatiles (in total about 5 µg/kg of fresh fruit), less than that obtained from most similar fruits, and this partly explains its delicate flavour. A group of "benzyl-related" compounds comprised over 45% of the essence and included a series of five alkyl benzoates. Methyl benzoate and methyl salicylate were both described as having sapodilla fruit aroma on odour evaluation of separated components at an odour port at the exist of the GC column. Ethyl benzoate and propiophenone had related aroma characteristics. AA

GRAPE

- 2068 NELSON (KE). Factors affecting removal of sulphur dioxide from atmospheres of table grapes.

Am. J. Enol. Vitic. 33(2); 1982; 61-6

A portable scrubbing unit equipped with water sprays or a packed column over which water is dripped can be effective in reducing the sulphur dioxide content of fumigation atmospheres. Efficiency of the scrubber in SO₂ removal is influenced by: 1) amount of water surface exposed to the gas laden air, 2) temperature of the water, 3) use of NaOH in the water as a neutralizing agent, 4) volume of water circulated in a closed system, and 5) use of a flow-through system to provide fresh water during scrubbing. The time required to remove the SO₂ from the room is influenced by: 1) ratio of the volume of air handled by the scrubber to that of the room, 2) efficiency of the scrubber in removing SO₂ on the water surface, and 3) the difference in concentration of SO₂ between the initial concentration and that to which the concentration is to be lowered. The application of the "half-scrubbing time" concept of evaluating the significance of the factors affecting time of SO₂ removal and efficiency of the scrubbing unit has been discussed. AA

- 2069 SCHREIER (R) and PAROSCHY (JH). Volatile components of wild grapes, *Vitis riparia*, M.

Can. Inst. Food Sci. Technol. J. 13(3); 1980; 118-21

- 2070 CABRAS (P), DIANA (P), MELONI (M) and PIRISI (FM). Residue determination of some insecticides and fungicides on grapes by reversed-phase high-performance liquid chromatography.

J. Agric. Food Chem. 30(7); 1982; 569-72

- 2071 FANTOZZI (P). Grape seed: A potential source of protein.

J. Am. Oil Chem. Soc. 58(12); 1981; 1027-31

Because grape seed is a potential source of edible protein, it is essential to remove the polyphenols to significantly improve protein digestibility. This study describes a procedure whereby grape seed protein concentrate is significantly purified and protein digestibility is improved. The procedure involves soaking whole seeds in an alkaline solution and subsequently extracting the protein with a concentrated salt solution. AA

BANANA

- 2072 GLASS (RW) and RAND (AG) Jr. Alginate immobilization of banana pulp enzymes for starch hydrolysis and sucrose interconversion.

J. Food Sci. 47(6); 1982; 1836-9

LEMON

- 2073 STAROSCIK (JA) and WILSON (AA). Quantitative analysis of cold-pressed lemon oil by glass capillary gas chromatography.

J. Agric. Food Chem. 30(3); 1982; 507-9

Cold-pressed lemon oil, derived from California and Arizona fruit, was analyzed by glass capillary gas chromatography. Thirty-seven components were determined in a single chromatographic run by using the internal standard method and a computing integrator. Six of these components, α -thujene, 3-carene, octanol, nerol, geraniol, and nonyl acetate, had not previously been quantitated in lemon oil. Because of the much higher resolution of capillary columns, compositional data from the present study should be more accurate than those previously obtained by packed column techniques. AA

ORANGE

- 2074 AHARONI (Y) and HOUCK (LG). Change in rind, flesh, and juice colour of blood oranges stored in air supplemented with ethylene or in oxygen-enriched atmospheres.

J. Food Sci. 47(6); 1982; 2091-2

Ruby, Tarocco, and Sanguinello blood oranges were stored 4 week at 15 C in flowing air, 20 ppm ethylene in air, 40% O₂ + 60% N₂, or 80% O₂ + 20% N₂ followed by storage in air. Ethylene caused rind colour of Ruby and Tarocco oranges to become deeper orange while 80% O₂ caused rind of Ruby and Sanguinello oranges to be paler orange than when stored in other atmospheres. Ethylene deepened red colour of the flesh and juice of Ruby and Tarocco oranges, but high O₂ more intensely deepened the red colour of flesh and juice of all three cultivars. Total soluble solids content, total acidity, or pH of the juice was not affected. Fruit stored in the ethylene atmosphere developed off-flavour. AA

- 2075 BRADDOCK (RJ) and MILLER (WM). Massflow and energy use during orange peel oil recovery.

J. Food Sci. 47(6); 1982; 2008-10

Electrical energy consumption and oil recovery were measured during operation of a commercial citrus peel oil centrifugation process. Two parts of a centrifuge's electrical consumption were identified: regular operation and the discharge cycle. During discharge cycles, the electrical energy ranged from 125-189% of the steady-state values. Energy costs were computed for the desludger and polisher centrifuges. Direct electrical costs for the oil mill totalled 0.67¢/kg oil recovered. Electrical costs calculated for finishing and dewaxing totalled 0.5¢/kg oil. Actual oil yield (1.1 kg/t) was only 20% of the total in the fruit. A major source of oil loss occurred during extraction from the fruit, where less than 50% of the oil was actually extracted into the dilute emulsion. Inefficient operation of the centrifuges accounted for most of the remaining losses. AA

PLUM

- 2076 ISMAIL (HMM), WILLIAMS (AA) and TUCKNOTT (OG). The flavour components of plum: An investigation into the volatile components of canned plums. Z. Lebensmittel Unters. Forsch. 171(4); 1980; 265-8

Gas chromatographic and gas chromatography mass spectrometric examination of the aroma components of canned plums obtained by both atmospheric distillation and headspace techniques showed them to be both quantitatively and qualitatively different from those of fresh plums. 25 components were identified, the major ones being 3-hydroxybutan-2-one, benzaldehyde, nonanal and 2 furaldehyde. Benzaldehyde and nonanal together with benzylacetate are believed to make a significant contribution to the aroma of canned plums. AA

JUJUBEA

- 2077 KADER (AA), LI (Y) and CHORDAS (A). Postharvest respiration, ethylene production, and compositional changes of Chinese Jujube fruits. Hortscience. 17(4); 1982; 678-9

Production rates of CO₂ and C₂H₄ by fruits of jujube (*Zizyphus Jujuba* Lam.), picked at the whitish-green stage and held at 20 C for 15 days, followed a nonclimacteric pattern. Skin colour changed from whitish-green to reddish-brown with fruit maturation. Relative to most other fresh fruits, Chinese jujubes are lower in water content and titratable acidity, and higher in total sugars (mostly reducing sugars) and phenolics. Chinese jujubes are very rich in ascorbic acid (Vitamin C) content which increased with maturation to 559 mg/100 g fresh weight. Fruits held at 0 C for 26 days exhibited sheet pitting due to chilling injury. AA

APPLE

- 2078 HANG (YD), LEE (CY) and WOODAMS (EE). A solid state fermentation system for production of ethanol from apple pomace. J. Food Sci. 47(6); 1982; 1851-2

A solid state fermentation system for the production of ethanol from apple pomace with a Montrachet strain of *Saccharomyces cerevisiae* is described. The yields of ethanol varied from about 29 g to more than 40 g per kg of apple pomace, depending on the samples fermented. Separation of up to 99% of the ethanol from spent apple pomace was achieved with a rotary vacuum evaporator. The results of this study indicate that the alcoholic fermentation of apple pomace might be an efficient method of alleviating waste disposal problems with the concomitant production of ethanol. AA

- 2079 DE POOTER (HL), DIRNICK (PJ), WILLAERT (GA) and SCHAMP (NM). Metabolism of propionic acid by golden delicious apples. Phytochemistry. 20(9); 1981; 2135-8

- 2080 GREENE (DW), LORD (WJ) and BRAMLAGE (WJ). Effects of gibberellins A₄+7 and 6-benzylamino purine of fruit set, fruit characteristics, seed content, and storage quality of 'McIntosh' apples. Hortscience. 17(4); 1982; 653-4

Spraying trees of 'McIntosh' apple (*Malus domestica* Bork.) with gibberellins A₄+7 (GA₄+7) + 6-benzylamino purine (BA) plus 1000 ppm daminozide 17 days after full bloom increased fruit set as GA₄+7+BA concentrations increased from 0 to 100 ppm, but did not alter fruit size, shape, or quality at harvest. Increased poststorage development of senescent breakdown with increasing concentration of applied GA₄+7+BA was attributable to increased occurrence of seedless fruit. Responses to treatments appeared to be due primarily to the GA₄+7 component and did not occur when GA₄+7+BA combination was applied after "June drop." Fruit flesh calcium concentration declined as GA₄+7+BA concentration increased. AA

- 2081 BERARD (LS), LOUGHEED (EC) and MURR (DP). β -galactosidase activity of 'McIntosh' apples in storage. Hortscience. 17(4); 1982; 660-61

Wall-bound β -galactosidase activity within the cortical flesh of 'McIntosh' apples (*Malus domestica* Bork) increased in storage, but was independent of fruit ripening. There was less activity in fruits held in low pressure storage than in those held in controlled atmosphere or in refrigerated storage, and less activity in fruits held at 0.5 than at 3.5 C. Fruit field-treated with butanedioic acid mono-(2,2-dimethylhydrazide) (daminozide) had more β -galactosidase activity than control fruits at harvest, and maintained higher β -galactosidase activity in storage, but did not soften more rapidly than control fruits. Storage treatments that led to rapid softening coincided with the highest

enzyme activity that developed in storage, but low enzyme activity was not consistently related to low softening rates. AA

SUGAR, STARCH AND CONFECTIONERY

- 2082 KEPPELER (RA) and ARBOLEDA (JR). The thermal properties of frozen invert sugar solutions.
J. Food Process. Eng. 5(2); 1981; 89-111
The thermal conductivity, thermal diffusivity, apparent heat capacity and density of frozen invert sugar solutions were found for 40, 50, 60 and 95% sugar inversion, each in concentrations from 2 to 35%, between -40 C and 3.9 C at 2.78 C temperature intervals. The apparatus and instrumentation used was identical with that reported by Keppeler and Boose (1970). AA
- 2083 INGLE (NJ) and KANWADE (LR). Effect of storability on quality of jaggery (Gur).
Indian Sugar. 32(1); 1982; 15-8
Jaggery wrapped with hessian and without hessian wrap were stored in two storage structures (reinforced cement and concrete (RCC) slab and tiled roof) and the changes in physical characteristics (shape, colour, moisture and bulk density) and chemical composition were observed over 5 month period. During storage, the RH ranged from 33-90% in RCC and 34-93% in tiled roof. RH increase was associated with increases in bulk density, moisture and reducing sugars. At higher RH, the shape was deformed and the colour changed from brownish yellow to dark brown. KMD
- 2084 MITTAL (BL). Qualitative improvement in juice sulphitation.
Indian Sugar. 31(11); 1982; 769-72
The defects of the sulphitation process in sugar manufacture from sugarcane juice are listed. The solutions to overcome these defects are described. MVG
- 2085 SIMPSON (TD), PARRISH (FW) and NELSON (ML). Crystalline forms of lactose produced in acidic alcoholic media.
J. Food Sci. 47(6); 1982; 1948-51, 1954
- 2086 ENGLYST (H), WIGGINS (HS) and CUMMINGS (JH). Determination of the non-starch polysaccharides in plant foods by gas-liquid chromatography of constituent sugars as alditol acetates.
Analyst. 107(1272); 1982; 307-18
A method is reported for the measurement of non-starch polysaccharides (NSP) from plant foods. NSP are the major components of "Dietary fibre." The polysaccharides are divided into cellulose and non-cellulosic material and the constituent sugars are determined by gas-liquid chromatography. Starch is removed, after gelatinisation, by incubation with hog pancreatic α -amylase together with pullulanase. The enzyme preparations are shown to be specific for the hydrolysis of α -1, 4- and α -1,6-glucosidic bonds, and not to affect NSP. The starch-free material is then analysed by three separate but complementary procedures: (A) hydrolysis with 1 M sulphuric acid after solubilisation of cellulose with 12 M sulphuric acid; (B) hydrolysis with 1 M sulphuric acid; and (C) extraction with phosphate buffer at pH 7 and 100 C, solubilisation of cellulose with 12 M sulphuric acid and then hydrolysis with 1 M sulphuric acid. Neutral sugars are measured by gas-liquid chromatography as alditol acetates and uronic acids by a colorimetric method. Starch made resistant to α -amylase digestion by food processing is identified by additional steps in procedure B, and measured as "resistant starch". Procedure A gives total NSP and procedure B neutral non-cellulosic polysaccharides. A value for cellulose is obtained as the difference between glucose measured in procedures A and B. Procedure C gives NSP insoluble in phosphate buffer at pH 7. Soluble NSP is the difference between total NSP and insoluble NSP. Results for the NSP analysis of selected foods are given. AA

- 2087 NARAYAN (KS) and RAMA SUBRAMANIAN (V). Rheological properties of polysaccharide gums.

Indian J. Technol. 20(9); 1982; 333-8

The functional dependence of the viscosity of 5 commonly used polysaccharide gums - xanthan, guar, sodium carboxymethyl cellulose, alginate, and karaya-on concentration shear rate, and temperature has been evaluated. The apparent activation energy of flow has been calculated at various shear rates by applying an Arrhenius type equation to the temperature dependence of viscosity. The polysaccharides fall into two distinct categories. Xanthan and guar gum form very viscous mucilages even at low concentration, but these mucilages exhibit a high degree of pseudoplasticity. Moreover, this activation energy for flow is low, and is independent of shear rate. The other three gums form viscous mucilages only at high concentration but the velocity/shear-rate curves are extended, indicating some dilatational contribution. The activation energy for flow of these three gums is high at low shear rates, but decreases with increasing shear rate. KMD

BAKERY PRODUCTS

- 2088 HOLAY (SH) and HARPER (JM). Influence of the extrusion shear environment on plant protein texturization.

J. Food Sci. 47(6); 1982; 1869-74

The effects of total nominal shear strain, apparent shear rate, shear stress in the die, and an integral temperature-time history function on textured soy protein properties were studied. These variables are independent of extruder size and can potentially serve as machine independent correlating factors. Correlation models showed that increasing shear strain and temperature-time in the screw tended to enhance cross-linking between protein molecules, while increasing shear through the die tended to disrupt the linkages. Moisture probably increases the mobility of the protein species which could improve cross-linking and reduced density while increasing water absorption. AA

BREAD

- 2089 COLLINS (JL), KALANTARI (SM) and POST (AR). Peanut hull flour as dietary fiber in wheat bread.

J. Food Sci. 47(6); 1982; 1899-1902, 1920

Peanut hull flour (PHF) at 0, 4, and 8% was added to wheat bread (WB) to increase the dietary fiber content. The bread was tested for textural properties, proximate composition, dietary fiber content, specific volume, colour, and some sensory attributes. While addition of PHF caused some changes in the bread, all samples were evaluated by a panel as being acceptable. From the standpoint of bread quality, PHF is an acceptable material which can be added to WB to increase the level of dietary fiber. AA

- 2090 SCOTT (PM) and LAWRENCE (GA). Losses of ergot alkaloids during making of bread and pancakes.

J. Agric. Food Chem. 30(3); 1982; 445-50

Studies were carried out to determine losses of six ergot alkaloids naturally occurring in whole wheat flour, rye flour, and triticale pancake mix after baking into bread or, with the latter flour, making into pancakes. Bread was also baked with spiked ergot-free flour. Estimations were made by gradient liquid chromatography (LC) with fluorescence detection, and mean overall alkaloid recoveries from flour and bread were 73-79% (peak height measurement). Mean losses on processing, although not determinable in some cases because of interferences, ranged up to 100% during baking of whole wheat bread, up to 85% during baking of rye bread, and up to 74% during making of triticale pancakes. AA

SPAGHETTI

- 2091 KHAN (MA), KLEIN (BP) and LEE (FV). Thiamin content of freshly prepared and leftover Italian spaghetti served in a University Cafeteria food-service.
J. Food Sci. 47(6); 1982; 2093-4

NOODLE

- 2092 KINGKATE (A), JAENGDAWANG (C), CHAKRANGKON (P), HALILAMIAN (C) and TOYODA (M). Residual sulphur dioxide in some Thai noodles.
J. Food Prot. 44(5); 1981; 334-6

MILK AND DAIRY PRODUCTS

- 2093 ALM (L). Effect of fermentation on volatile acids and ethanol in Swedish dairy products.
J. Dairy Sci. 65(2); 1982; 186-90
Acetic, propionic, and butyric acids in Swedish fermented milk products were measured by steam distillation followed by gas-liquid chromatography whereas ethanol content was measured by an enzymatic method. Acetic acid was low in yoghurt (less than 20 mg/100 g); but high in bifidus milk (more than 600 mg/100 g). Other products showed intermediate acetic acid, whereas propionic and butyric acid contents were low in all products investigated. Ethanol content of Swedish fermented products was low except for kefir, which initially contained about 20 mg/100 g (day 1), and following storage 200 mg/100 g (day 11).
AA
- 2094 GYANEDRA KUMAR. Flexible packaging materials and their application in dairy industry.
Indian Dairyman. 34(11); 1982; 217-20
The flexible packaging materials covered are paper, polyethylene, polypropylene, polyvinyl chloride, polyvinylidene chloride, polyvinyl alcohol, polystyrene, polyfluoro ethylenes, polyamides, polyester, pliofilm, Al. foil, and laminates. MVG
- 2095 PATEL (KK) and SHAH (CM). Steam boilers for dairy plants.
Indian Dairyman. 34(11); 1982; 205-12
Essentials of various types of boilers for dairy plants including packaged boilers and their selection criteria are discussed. MVG
- 2096 RON RICHTER. Microbiological problems in dairy foods in the 1980s.
J. Food Prot. 44(6); 1981; 471-5
- 2097 NORBACK (JP) and MATHEWS (ME). Data structures for integrating quality and cost factors in a foodservice operation.
J. Food Prot. 44(5); 1981; 364-8

MILK

- 2098 HAGVANE (LR), KULKARNI (MB) and CHAVAN (IG). Cost of chilling and operational efficiency at milk chilling plant: A case study.
Indian Dairyman. 34(11); 1982; 197-203
Parameters like chilling cost of milk, break-even point, utilisation of installed capacity and rate of return were studied for one year in a new public sector milking plant established in rural area of Maharashtra, India. The data indicated that during the initial stages of the chilling, plant, chilling cost is high which can be brought down by planned efforts, particularly in ensuring higher quantities of milk to

be handled by minimum possible man power and at maximum managerial efficiency at all levels. MVG

- 2099 JANZEN (JJ), BODINE (AB) and BISHOP (JR). Effects of package temperature and days of storage on the flavour score of processed milk. J. Food Prot. 44(6); 1981; 455-8
Shelf-life studies were made on commercially pasteurized milk packaged in fibreboard and blow-mold plastic containers, using two temperatures of storage (4.5 and 7 C) and 0, 7 and 14 days of storage. Quality parameters evaluated were flavour, standard plate count, coliform count, oxidase positive bacteria count and acid degree value. The data suggest a shelf life (flavour score ≥ 36.0) of 2-3 days at 7 C and 7 days at 4.5 C. No significant ($P > 0.01$) differences, in the parameters measured, were noted between milk packaged in fiberboard and plastic jugs which were not exposed to fluorescent light. A second phase of this study examined the shelf-life of commercially pasteurized milk packaged in fiberboard containers only. The milks were tested at 0, 3, 5, 7, 9, 11 and 13 days of storage, using the same parameters noted above. The results suggested a satisfactory shelf-life of 11 and 9 days, respectively, for storage temperatures of 4.5 and 7.0 C. AA
- 2100 GARNOT (P) and OLSON (NF). Use of oscillatory deformation technique to determine clotting times and rigidities of milk clotted with different concentrations of rennet. J. Food Sci. 47(6); 1982; 1912-5
- 2101 HEMKEN (RW), FOX (JD) and HICKS (CL). Milk iodine content as influenced by feed sources and sanitizer residues. J. Food Prot. 44(6); 1981; 476-9
Increased use of organic iodine in feed has resulted in high levels of milk in some dairy herds. In a few instances, the misuse of iodine sanitizers in the dairy industry has also contributed to increased milk iodine. Teat dips with levels of iodine under 1% should be used if the efficacy to reduce new mastitis infections is clearly established. VR
- 2102 TAKAHASHI (W), SAIDIN (D), TAKEI (G) and WONG (L). Organochlorine pesticide residues in human milk in Hawaii, 1979-80. Bull. Environ. Contam. Toxicol. 27(4); 1981; 506-11
- 2103 BEDDOWS (CG). The status of fluoride added to bovine milk. I. Fluoride in cold milk. J. Food Technol. 17(1); 1982; 55-62
- 2104 BEDDOWS (CG) and BLAKE (C). The status of fluoride in bovine milk. II. The effect of various heat treatment processes. J. Food Technol. 17(1); 1982; 63-70
- 2105 RADFORD (DV), TCHAN (YT) and McPHILLIPS (J). Detection of cow's milk in goat's milk by immunoelectrophoresis. Aust. J. Dairy Technol. 36(4); 1981; 144-6
A simple, reliable and accurate method for detecting cow's milk added to goat's milk is described. The method is rocket immunoelectrophoresis employing anti-cow's milk serum produced by a goat. Using this technique, cross-reaction between goat's milk and the antibody is almost totally absent and the tedious purification of the anti-serum which is essential when the antibody is developed in other laboratory animals such as rabbits is avoided. Rocket immunoelectrophoresis provides a quantitative, unambiguous indication of adulteration of goat's milk, in a form which is easily preserved as a permanent record. Concentrations of 5% cow's milk in goat's milk are very easily demonstrated but as little as 1% can be detected and estimated without varying the antigen-antibody ratio used. AA

- 2106 HAVERY (DC), HOTCHKISS (JH) and FAZIO (T). Rapid determination of volatile nitrosamines in nonfat dry milk. *J. Dairy Sci.* 65(2); 1982; 182-5
A rapid gas chromatographic-thermal energy analysis method was developed for determination of volatile nitrosamines in nonfat dry milk. The average recovery of nitrosodimethylamine added to nonfat dry milk at 3 ppb was 96%. In a nationwide survey of nonfat dry milk, nitrosodimethylamine was found in 48 of 57 samples from 0.1 to 3.7 ppb, and at an average 0.6 ppb. Apparent nitrosopyrrolidine and nitrosopiperidine averaged approximately 0.1 ppb, the detection limit of the method. AA
- 2107 WELLNITZ-RUEN (W), REINECCIUS (GA) and THOMAS (EL). Analysis of the fruity off-flavour in milk using headspace concentration capillary column gas chromatography. *J. Agric. Food Chem.* 30(3); 1982; 512-4
Ethyl butyrate and ethyl hexanoate, compounds considered to be primarily responsible for the fruity off-flavour in milk, were measured by using an automated headspace concentration system coupled to a capillary column gas chromatograph. Sampling conditions were optimized for recovery of the esters in whole milk. Concentrations as low as 0.001 ppm could be detected and quantified. The coefficients of variation for ethyl butyrate and ethyl hexanoate at this concentration were 61.7% and 53.2% while relative errors were 55.6% and 23.5%, respectively. Sensory analysis determined a fruity flavour threshold of 0.01 ppm (0.005 ppm of ethyl butyrate and 0.005 ppm of ethyl hexanoate) in whole milk. At this level, the headspace concentration system quantified these esters with 29.9-36.4% relative error and 25.3-30.7% coefficient of variation. Commercial milks judged to be fruity by sensory analysis were found to contain ethyl butyrate and ethyl hexanoate concentration of 0.026-0.152 and 0.20-0.268 ppm, respectively. AA
- 2108 ROSS (GD). The inhibition of growth of spoilage microorganisms in milk by *Streptococcus lactis* subsp. *diacetylactis*, *Leuconostoc cremoris* and *L. dextranicum*. *Aust. J. Dairy Technol.* 36(4); 1981; 147-52
The degree of inhibition of some spoilage microorganisms of cultured dairy products by strains of *Streptococcus lactis* subsp. *diacetylactis*, *Leuconostoc cremoris* and *L. dextranicum* was tested. *Pseudomonas aeruginosa* was inhibited by up to 74% by *S. lactis* subsp. *diacetylactis*. Inhibition of *Enterobacter aerogenes*, 2 strains of *Escherichia coli*, *Streptococcus faecalis* and *Kluyveromyces fragilis* by most lactic acid bacteria was low. Inhibition of the lactic acid bacteria by all spoilage microorganisms was negligible. The contribution of lactic acid and hydrogen peroxide, inactivated by catalase, to total inhibition of all spoilage microorganisms was not significant. *P. aeruginosa* was the only spoilage microorganism inhibited by all lactic acid bacteria in fermented milk held for up to 16 days at 7 C. AA
- 2109 HERNANDEZ (R) and ASENJO (JA). Production and characterization of an enzymatic hydrolysate of skim milk lactose and proteins. *J. Food Sci.* 47(6); 1982; 1895-8, 1911
- 2110 GRUNEWALD (KK). Serum cholesterol levels in rats fed skim milk fermented by *Lactobacillus acidophilus*. *J. Food Sci.* 47(6); 1982; 2078-9
- 2111 UPADHYAY (KG), VYAS (SH) and PANDYA (AJ). Instantization of milk powders. *Indian Dairyman.* 34(11); 1982; 187-96
Principles of instantization or the process in which the reconstitution properties of the milk powders in cold water are greatly enhanced and the methods of instantization, namely, the re-wet method or agglomeration process, the straight-through or single pass process and the method based on use of additives are described. Tests for judging the instant properties of milk powders like wettability test, dispersibility test and rate of dehydration test are described. MVG

CURD

- 2112 MEHTA (AM), PATEL (KA) and DAVE (P.J). Inhibition of *Staphylococcus aureus* by two strains of *Streptococcus cremoris* isolated from curd. *Arogya*. 8(1); 1982; 62-6

YOGHURT

- 2113 RAO (KRS), KRISHNAPPA (N) and NAMBUDRIPAD (VK). Standardisation of the method of preparation of 'yoghurt' at room temperature. *Indian J. Nutr. Dietet.* 19(5); 1982; 149-52
A mixed culture of *Streptococci thermophilus* and *Lactobacillus bulgaricus* was used for preparation of yoghurt at room temperature. Based on coagulation time and production of acidity a ratio of 1:2 of *S. thermophilus* and *L. bulgaricus* gave a good quality product. Addition of 0.2% sodium alginate during processing decreased ropiness to a significant level and gave a satisfactory textured product. BSN
- 2114 LABROPOULOS (AE), PALMER (JK) and TAO (P). Flavour evaluation and characterization of yoghurt as affected by ultra-high temperature and vat processes. *J. Dairy Sci.* 65(2); 1982; 191-6
- 2115 RUBIN (HE), NERAD (T) and VAUGHAN (F). Lactate acid inhibition of *Salmonella typhimurium* in yoghurt. *J. Dairy Sci.* 65(2); 1982; 197-203

WHEY

- 2116 BLAKEBROUGH (N) and MORESI (M). Scale-up of whey fermentation in a pilot-scale fermenter. *European J. Appl. Microbiol. Biotechnol.* 12(3); 1981; 173-8
The effects of mixing and lactose concentration on yeast growth, lactose consumption, COD reduction and dissolved oxygen have been studied at in a 100 - l fermenter. KAR

CHEESE

- 2117 MOHAMED (MO), MORRIS (HA) and BREENE (WM). A comparison on stirred curd cheeses made from normal milks and reconstituted nonfat dry milk filled with vegetable oils. *J. Food Process. Preserv.* 6(1); 1982; 15-30
Cheeses made from 30% total solids (TS) mixtures of reconstituted nonfat dry milk and vegetable oils were compared with cheeses made from 12.5% TS mixtures and with cheeses made from normal milk. The 30% TS filled milks produced cheeses having firmer curd, lower moisture content and better body and texture characteristics than those made from 12.5% TS filled milks. The rate of acid development during cheese making was slower in filled milks than in normal milks. Filled cheeses were always graded lower than normal milk cheeses. The 30% TS filled milk cheeses were significantly harder than 12.5% TS filled milk cheeses and normal milk cheeses. Cheeses containing coconut oil were harder than those containing soyabean oil. AA
- 2118 METWALLI (NH), SHALABI (SI), ZAHRAN (AS) and EL-DEMERDASH (O). The use of soyabean milk in soft-cheese making. I. Effect of soyabean milk on rennet coagulation property of milk. *J. Food Technol.* 17(1); 1982; 71-77
The compositions of soyabean milk and whole milk were compared. The two milks were similar in their pH, acidity and protein level, while they differed in the ash, carbohydrate and fat content. Pronounced differences were observed in their amino acid contents. Yield and amino acid

content of soyabean milk depend to a large extent on the method of extraction. Addition of soyabean milk to milk greatly inhibits the rennet coagulation of milk. Mixing soyabean milk with raw milk in the ratio of 1:4 was found to be the most suitable proportion for cheese making, with the alteration of the cheese making process by increasing the amount of rennet, addition of calcium chloride and lowering the pH. AA

- 2119 SHANLEY (RM) and JAMESON (GW). A study of the rapid determination of moisture in cheese by microwave heating.
Aust. J. Dairy Technol. 36(3); 1981; 107-9

A modified domestic microwave oven was used for rapid determination of the moisture contents of 19 cheese and cheese products, with moisture levels in the range 16-78%. For 16 of the samples, the results did not differ significantly from those obtained by a reference method. Minimum heating conditions varied with the type of cheese. Cheddar, for example, required microwave heating for 6 minutes in an oven previously heated to 45 C. A final 2 minutes period of resistive heating was used for all products. Results using the new method exhibited greater variation than those from the reference method. The method is suitable for simultaneous assay of multiple samples. AA

- 2120 MOTOKI (M), TORRES (JA) and KAREL (M). Development and stability of intermediate moisture cheese analogs from isolated soyabean proteins.
J. Food Process. Preserv. 6(1); 1982; 41-53

Intermediate moisture cheese analogs (IMCA), based on soyabeans, were fabricated by the blending method from an aqueous emulsion containing primarily soyabean protein isolate, casein, hydrogenated vegetable oil, decaglycerol decaoleate, glycerol, salt and sorbitol. Potassium sorbate was used as a mycostatic agent. Water activity of different IMCA preparations was controlled at levels of 0.83 to 0.91; and pH at 5.0, 5.5 and 6.5. Organoleptic properties, mechanical properties and microbial stability were tested. The IMCA product with a a_w of 0.87 and pH of 5.7 was the most acceptable, with a shelf life of about 3 months. AA

- 2121 SUTHERLAND (BJ) and JAMESON (GW). Composition of hard cheese manufactured by ultrafiltration.
Aust. J. Dairy Technol. 36(4); 1981; 136-43

Whole milk was concentrated 4.8-fold by ultrafiltration with systematic variation by lactose and mineral levels, achieved by adjustment of the level of diafiltration and the milk pH. The retentates were converted to Cheddar cheese by a procedure based on conventional cheddar manufacture. This yielded cheese which resembled conventionally made cheddar and small volumes of protein-rich whey. The chemical composition and quality aspect of this cheese is discussed. KAR

- 2122 BRAUN (SD), OLSON (NF) and LINDSAY (RC). Microencapsulation of bacterial cell-free extract to produce acetic acid for enhancement of cheese flavour.
J. Food Sci. 47(6); 1982; 1803-7

- 2123 HORI (T). Effects of freezing and thawing green curds before processing on the rheological properties of cream cheese.
J. Food Sci. 47(6); 1982; 1811-7

The rheological and proton pulsed NMR properties of cream cheese made from the green curds frozen and thawed were measured to determine the quantitative relationship between the freezing and thawing rates of the curds and the textural changes of the cream cheese. The hardness of the cream cheese decreased significantly as the thawing rate of the curds decreased, whereas the freezing injury was the minor source of the damage on the hardness. The bound but not free water in the cheese characterized these textural changes. AA

MEAT AND POULTRY

- 2124 KOSOJ (VD), TUMENOV (SN), ZVONOV (OV) and KRJUCKOV (VN). Safety techniques without mixers.
Fleisch. 34(1); 1980; 10 (German)
- 2125 HERMANSSON (A-M) and LUCISANO (M). Gel characteristics - waterbinding properties of blood plasma gels and methodological aspects on the water-binding of gel systems.
J. Food Sci. 47(6); 1982; 1955-9, 1964
- 2126 HERMANSSON (A-M). Gel characteristics - compression and penetration of blood plasma gels.
J. Food Sci. 47(6); 1982; 1960-64
- 2127 HERMANSSON (A-M). Gel characteristics-structure as related to texture and waterbinding of blood plasma gels.
J. Food Sci. 47(6); 1982; 1965-72
- 2128 FINNE (G). Modified - and controlled - atmosphere storage of muscle foods.
Food Technol. 36(2); 1982; 128-33
- 2129 SCHIEFER (G). Colloquium about the application of starter cultures in the meat industry.
Fleisch. 34(1); 1980; 4-5 (German)
- 2130 SIMMONS (CWR). Microbial contamination in meat processing.
Food Flavour. Ingrid. Process. Pack. 4(1); 1982; 25-7, 29
Discusses: meat; nature of spoilage; seasonings, pastry mixes and cakes; and process operations (boning out, bake off, communiton, jellying, curd products). BSN
- 2131 CYZESKA (FJ), SEITER (JA), MARKS (SN) and JAY (JM). Culture medium for selective isolation and enumeration of gram-negative bacteria from ground meats.
Appl. Environ. Microbiol. 42(2); 1981; 303-7
- 2132 TURNBULL (PCB) and ROSE (P). *Campylobacter jejuni* and *Salmonella* in raw red meats. A Public Health Laboratory Service survey.
J. Hyg. 88(1); 1982; 29-37
- 2133 OKAYAMA (T), ANDO (N) and NAGATA (Y). Low-molecular weight components in sarcoplasm promoting the colour formation of processed meat products.
J. Food Sci. 47(6); 1982; 2062-3
- 2134 HAND (LW), TERRELL (RN) and SMITH (GC). Effects of chloride salts on physical, chemical and sensory properties of frankfurters.
J. Food Sci. 47(6); 1982; 1800-802, 1817
- 2135 JONES (KW) and MANDIGO (RW). Effects of chopping temperature on the microstructure of meat emulsions.
J. Food Sci. 47(6); 1982; 1930-35
- 2136 HALLERBACH (CM) and POTTER (NN). Effects of nitrite and sorbate on bacterial populations in frankfurters and Thuringer cervelat.
J. Food Prot. 44(5); 1981; 341-6
- 2137 TERRELL (RN), HEILIGMAN (F), SMITH (GC), WIERBICKI (E) and CARPENTER. Effects of sodium nitrite, sodium nitrate and DL, alpha-tocopherol on properties of irradiated frankfurters.
J. Food Prot. 44(6); 1981; 414-7

BEEF

- 2138 MANDIGO (RW) and OLSON (DG). Effect of blade size for mechanically tenderizing beef rounds.
J. Food Sci. 47(6); 1982; 2095-6
- 2139 COSTELLO (WJ), SEIDEMAN (SC), MICHELS (JD) and QUENZER (NM). Effect of comminution method and pressure on restructured beef steaks.
J. Food Prot. 44(6); 1981; 425-9
Restructured steaks were made using six methods of meat comminution: a) sliced parallel (b) sliced perpendicular to muscle fibers (2 mm thick slice), (c) flaked at -5 C, (d) flaked at -2.2 C, (e) flaked at 2.2 C and (f) ground through a 3.2 mm plate. Meat used was from cow inside rounds. After comminution, meat was stuffed into casings and pressed under pressure (200,600 or 1000 psi). The "logs" were then frozen, cut into steaks and evaluated for cooking characteristics and sensory attributes. Intact round steaks were used for controls. The amount of pressure used to form the restructured steaks had no effect ($P > 0.05$) on any of the cooking characteristics or sensory properties. Particle production method had no effect ($P > 0.05$) on cooking characteristics; however, tenderness, texture description and flavour desirability ratings were higher ($P > 0.05$) for flaked steaks as compared to the sliced or intact steaks. AA
- 2140 ABERLE (ED), REEVES (ES), JUDGE (MD), HUNSLEY (RE) and PERRY (TW). Palatability and muscle characteristics of cattle with controlled weight gain: Time on a high energy diet.
J. Anim. Sci. 52(4); 1981; 757-63
- 2141 SOLOMON (MB), MOODY (WG), KEMP (JD) and ELY (DG). Effect of breed, slaughter weight and sex on histological properties of ovine muscle.
J. Anim. Sci. 52(5); 1981; 1019-25
- 2142 RIDER (GR), WALTERS (LE), FRAHM (RR), MORRISON (RD), McNEW (RW) and LAMBERT (BW). Evaluation of adjusted net ^{40}K count as a predictor of muscle mass in yearling beef bulls.
J. Anim. Sci. 52(4); 1981; 764-8
- 2143 KEMP (JD), ELY (DG), FOX (JD) and MOODY (WG). Carcass and meat characteristics of crossbred lambs with and without Finnish landrace breeding.
J. Anim. Sci. 52(5); 1981; 1026-33
- 2144 CHAMBERS (E) IV, COWAN (OA) and HARRISON (DL). Histological characteristics of beef and pork cooked by dry or moist heat in a conventional or microwave oven.
J. Food Sci. 47(6); 1982; 1936-9, 1947
- 2145 BRADY (PL) and PENFIELD (MP). Effects of heating system, temperature and rate of heating on sensory characteristics of beef.
J. Food Sci. 47(6); 1982; 1783-5, 1792
- 2146 BERRY (BW), SMITH (GC) and CROSS (HR). Constant time versus constant temperature cooking of beef loin steaks as influenced by marbling characteristics and intramuscular fat content.
J. Anim. Sci. 52(5); 1981; 1034-40
- 2147 BOOREN (AM), MANDIGO (RW), OLSON (DG) and JONES (KW). Characterization of exudate proteins involved in binding meat pieces into a sectioned and formed beef steak.
J. Food Sci. 47(6); 1982; 1943-7
- 2148 BENNINK (MR) and ONO (K). Vitamin B₁₂, E and D content of raw and cooked beef.
J. Food Sci. 47(6); 1983; 1786-92

The relationship of carcass grade, primal cuts and cooking to vitamin B₁₂, E and D in separable lean beef was studied. The average vitamin B₁₂ content in 471 samples of raw and cooked beef was 3.17 µg/100 g. The vitamin B₁₂ content of raw and cooked beef was similar; however, on considering the moisture and fat losses during cooking, there was a 27-33% loss of B₁₂. The vitamin E content of raw and cooked beef was similar and averaged 133 µg/100g for 464 samples. From 33-44% of the original vitamin E in the meat was lost upon cooking. Raw and cooked beef contained 80-100 ng of vitamin D/100g, with 35-42% of the original vitamin D content being lost upon cooking. The content of vitamins E and D in beef is low and of little nutritional importance; however, beef is an important dietary source of vitamin B₁₂. AA

- 2149 ALABRAN (DM). Isolation and identification of additional beef flavour precursors.
J. Agric. Food Chem. 30(3); 1982; 486-8
A beef fraction previously obtained by water extraction of lipid-free freeze-dried beef, ultrafiltration of the aqueous extract, and gel permeation chromatography of the ultrafiltrate was further fractionated by high-pressure liquid chromatography, and the components were identified by nuclear magnetic resonance and infrared spectroscopy. The compounds isolated and identified are glutamic acid, lactic acid, phosphoethanolamine, glycerol, creatine, and creatinine and represent 94% of the fraction. Some minor constituent amino acids were also identified. AA
- 2150 HSU (C-M), PETERSON (RJ), JIN (QZ), HO (C-T) and CHANG (SS). Characterization of new volatile compounds in the neutral fraction of roasted beef flavour.
J. Food Sci. 47(6); 1982; 2068-7, 2071
- 2151 CHASTAIN (MF), HUFFMAN (DL), HSIEH (WH) and CORDRAY (JC). Antioxidants in restructured beef/pork steaks.
J. Food Sci. 47(6); 1982; 1779-82
- 2152 CIOLETTI (LJ), GILLILAND (SE) and HENRICKSON (RL). Acetic acid, formic acid, and potassium sorbate as preservatives for short term storage of bovine hides.
J. Food Sci. 47(6); 1982; 1793-6
- 2153 NORTJE (GL) and NAUDE (RT). Microbiology of beef carcass surfaces.
J. Food Prot. 44(5); 1981; 355-8
Despite mean initial counts of $4.5-7.7 \times 10^2$, intermediate handling and the subsequent contamination that took place along the dressing line, the final chilling process rendered carcasses with acceptable bacterial levels ($<2.5 \times 10^2$). AA
- 2154 DONNELLY (LS), ZIEGLER (GR) and ACTON (JC). Effect of liquid smoke on the growth of lactic acid starter cultures used to manufacture fermented sausage.
J. Food Sci. 47(6); 1982; 2074-5

PORK

- 2155 SWATLAND (HJ). Fiber optic spectrophotometry and the wetness of meat.
J. Food Sci. 47(6); 1982; 1940-42, 1954
- 2156 LENGERKEN (GR) and HENNEBACH (H). Influence of endogenic and exogenic factors on the behaviour of the pH value in the cutlet and bacon muscles of pigs. Part I.
Fleisch. 34(1); 1980; 16-9 (German)
The results show that the average pH values and the portion of pigs with a pH value ≤ 5.8 (Indicator of high colour brightness and low water absorption capacity of the meat) are strongly dependent on the

race, lineage and genetic constitution of the pigs. Other factors influencing the quality of the meat are stunning, resting period and transportation. KMD

- 2157 LASER - REUTERSWARD (A), ASP (N-G), BJORCK (I) and RUDERUS (H). Effect of collagen content and heat treatment on protein digestibility and biological value of meat products.
J. Food Technol. 17(1); 1982; 115-23
The digestibility and biological value of meat mixed with various amounts of collagen were measured after heat treatments. The M. biceps femoris muscle was used as the source of meat and pigskin as the source of collagen. The latter contained 78.9% collagen and digestibility both heated and raw was 95%. The NPU of mixtures of meat and pigskin showed a relation with collagen content defined as $y = 82.8 - 0.6 x$. Supplementation of pigskin at a pigskin-meat mixture containing 50% collagen with methionine did not increase NPU. The amount of collagen in untreated meat products is 15-30% and will be of negligible nutritional significance in a whole diet. AA
- 2158 FREEMAN (RL), EBERT (AG), LYTLE (RA) and BACUS (JN). Effect of sodium nitrite on flavour and TBA values in canned, comminuted ham.
J. Food Sci. 47(6); 1982; 1767-70
- 2159 HAND (LW), TERRELL (RN) and SMITH (GS). Effects of chloride salt, method of manufacturing and frozen storage on sensory properties of restructured pork roasts.
J. Food Sci. 47(6); 1982; 1771-2
- 2160 HAND (LW), TERRELL (RN) and SMITH (GC). Effects of complete or partial replacement of sodium chloride on processing and sensory properties of hams.
J. Food Sci. 47(6); 1982; 1776-8, 1782
- 2161 STEELE (JE) and STILES (ME). Food poisoning potential of artificially contaminated vacuum packaged sliced ham in sandwiches.
J. Food Prot. 44(6); 1981; 430-34
- 2162 STEELE (JE) and STILES (ME). Microbial quality of vacuum packaged sliced ham.
J. Food Prot. 44(6); 1981; 435-9
- 2163 POWERS (EM), BERKOWITZ (D) and WALKER (GC). Bacteriology, water activity and moisture/salt ratio of six brands of precooked canned bacon.
J. Food Prot. 44(6); 1981; 447-9
- 2164 TANAKA (T). Effect of dl- α -tocopherol on antibotulinal effectiveness of sodium nitrite in bacon.
J. Food Sci. 47(6); 1982; 1797-9, 1807
- 2165 PIERSON (MD) and REDDY (NR). Inhibition of *Clostridium botulinum* by antioxidants and related phenolic compounds in comminuted pork.
J. Food Sci. 47(6); 1982; 1926-9, 1935

POULTRY

- 2166 LEISTERT (J). Present status and development of the slaughtering of poultry in the GDR.
Fleisch. 34(1); 1980; 6-7 (German)
- 2167 ZSIGO (I) and RAEUBER (HJ). Ascertainment of the parameters of telpher overhead conveyors for slaughtering of poultry.
Fleisch. 34(1); 1980; 12-5 (German)

CHICKEN

- 2168 MAST (MG), UIJTENBOOGAART (Th.G), GERRITS (AR) and De VRIES (AW). Effect of auger- and press-type mechanical deboning machines on selected characteristics of mechanically deboned poultry. J. Food Sci. 47(6); 1982; 1757-62, 1766
- 2169 LILLARD (HS). Improved chilling systems for poultry. Food Technol. 36(2); 1982; 58-67
Various chilling methods are compared to immersion chilling of poultry. The methods compared include cryogenic chilling, spray chilling, air chilling, and evaporative vacuum cooling. Controlled immersion chilling proved to be the most efficient and least costly method of cooling. KAR
- 2170 ANG (CYW), HAMM (D) and SEARCY (GK). Changes in nutrient content during chill-holding of ice-packed and deep-chilled broilers. J. Food Sci. 47(6); 1982; 1763-6
- 2171 THOMSON (JE), COX (NA), BAILEY (JS) and ISLAM (MN). Minimizing *Salmonella* contamination on broiler carcasses with poly (hexamethylenebiguanide hydrochloride). J. Food Prot. 44(6); 1981; 440-1

TURKEY

- 2172 JONES (JM) and ROONEY (CC). Observations on the glutamic-oxaloacetic transaminases of turkey breast muscle during chill storage. J. Food Technol. 17(1); 1982; 135-8

EGG

- 2173 GAVORA (JS), LILJEDAHN (LE), McMILLAN (I) and AHLEN (K). Comparison of three mathematical models of egg production. Br. Poult. Sci. 23(4); 1982; 339-48
- 2174 CALLEBAUT (M). A new method for making an artificial air space on top of fertilized avian eggs. Poult. Sci. 60(4); 1981; 723-5
This report presents a rapid, hemorrhage-free method for fenestration of embryo containing avian eggs. The procedure is safe for any kind of bird egg and can be used before the chorioallantois becomes tightly fixed to the shell membrane. After treatment by this technique, a substantial number of chicks will be able to hatch and to develop normally. AA
- 2175 ABE (Y), ITOH (T) and ADACHI (S). Fractionation and characterization of hen's egg yolk phosvitin. J. Food Sci. 47(6); 1982; 1903-7
- 2176 HICKSON (DW), ALFORD (ES), GARDNER (FA), DIEHL (K), SANDERS (JO) and DILL (CW). Changes in heat-induced rheological properties during cold storage of egg albumen. J. Food Sci. 47(6); 1982; 1908-11

GEESE

- 2177 SWATLAND (HJ). Muscle fiber histochemistry in breast and leg meat of geese. Can. Inst. Food Sci. Technol. J. 13(3); 1980; 135-6

SEAFOODS

FISH

- 2178 LAIRD (WM), MACKIE (IM) and RITCHIE (AH). Differentiation of species of fish by isoelectric focussing on agarose and polyacrylamide gels. A comparison.
J. Assoc. Publ. Anal. 20(4); 1982; 125-35
Detailed experimental procedures are given for the differentiation of species of fish by isoelectric focusing on agarose and polyacrylamide gels. Separation patterns for a wide range of commercially important species are given and the relative merits of the two systems are compared. AA
- 2179 KLUSEK (CS) and HEIT (M). Effect of different preservation methods on the trace element concentrations of fish and mussel tissues.
Bull. Environ. Contam. Toxicol. 28(2); 1982; 202-7
- 2180 KRUSE (R). Multiple determination of Pb and Cd in fish by electrothermal AAS after wet-ashing in commercially available teflon-beakers.
Z. Lebensmittel-Unters. Forsch. 171(4); 1980; 261-4 (German)
A method is described for an acid digestion of biological samples, especially of fish tissue, followed by electrothermal AAS of Pb and Cd. The digestion is performed in commercially available teflon beakers, which are closed without compression by teflon covers. Contamination is thereby avoided and the temperature can rise to at least 250 C. The digestion mixture, which consists of $\text{HNO}_3 + \text{HClO}_4$ is easily evaporated to dryness, while complete mineralisation of the sample material is achieved. The residual matrix shows good solubility in dilute HNO_3 . Matrix interferences during the atomisation step can be minimized. Well reproducible results are obtained even in the sub-ppm range with extremely low blanks. AA
- 2181 CHRISTENSEN (BW), KJAER (A) and MADSEN (JO). Volatile sulphur compounds and other headspace constituents of North Sea fish oils.
J. Am. Oil Chem. Soc. 58(12); 1981; 1053-7
Headspace fractions of industrial oils produced from North Sea fish have been studied with emphasis on their sulphur-containing constituents, suspected inhibitors in the subsequent, catalytic oil hardening process. Fourteen individual, volatile sulphur compounds have been identified, accounting for virtually the total amount of such compounds in the volatile fraction. Sulphides, linear and cyclic di- and polysulphides, and a homologous series of methyl thiolesters, together make up the chemical patterns. Gas chromatography combined with mass spectrometry revealed a complex, but surprisingly constant pattern of the total, volatile fractions of several North Sea fish oils. About 100 individual compounds, including those containing sulphur, have been fully or partly identified. The structural characteristics and possible origin of the various types of compounds are discussed briefly. AA
- 2182 KAITARANTA (JK). Hydrolytic changes in the lipids of fish roe products during storage.
J. Food Technol. 17(1); 1982; 87-98
- 2183 CARDELLO (AV), SAWYER (FM), MALLER (O), and DIGMAN (L). Sensory evaluation of the texture and appearance of 17 species of North Atlantic fish.
J. Food Sci. 47(6); 1982; 1818-23
- 2184 BREMNER (HA). Taster response to salt in minced fish.
J. Food Sci. 47(6); 1982; 2066-7

- 2185 MURRAY (BP), STANLEY (DW) and GILL (TA). Improved utilization of fish protein: Co-extrusion of mechanically deboned salted minced fish. Can. Inst. Food Sci. Technol. J. 13(3); 1980; 125-30
- Co-extrudates were produced from mixtures of soy and fish proteins by thermal extrusion. The influence of source and level of protein and processing variables was investigated. It was found that the texture of the co-extrudates, as determined by the OTMS compression-extrusion cell, depended strongly upon both the ratio of protein to water and vegetable to fish protein. Texture was improved by the addition of fish which also reduced the temperature required for optimal texturization. Addition of fish also raised the level of essential amino acids. Use of the co-extrudates in a standard meat loaf formula did not lower instrumental texture values relative to an all-meat product except with high protein to water material. Sensory data showed that a formulation of this type would probably not be accepted by Canadian consumers because of the fishy flavour and odour that was present in the starting fish and persisted through extrusion. AA

COD

- 2186 DOE (PE), HASHMI (R), POULTER(RG) and OLLEY (J). Isohalic sorption isotherms. I. Determination for dried salt cod (*Gadus morrhua*). J. Food Technol. 17(1); 1982; 125-34

MACKEREL

- 2187 JHAVERI (SN), LEU (S-S) and CONSTANTINIDES (SM). Atlantic mackerel (*Scomber scombrus* L): Shelf life in ice. J. Food Sci. 47(6); 1982; 1808-10

ATLANTIC CROAKER

- 2188 LIU (YM), LIN (TS) and LANIER (TC). Thermal denaturation and aggregation of actomyosin from Atlantic croaker. J. Food Sci. 47(6); 1982; 1916-20
- 2189 LANIER (TC), LIN (TS), LIU (YM) and HAMANN (DD). Heat gelation properties of actomyosin and surimi prepared from Atlantic croaker. J. Food Sci. 47(6); 1982; 1921-5

FINFISH

- 2190 MEINKE (WW), FINNE (G), NICKELSON (R) II and MARTIN (R). Nutritive value of fillets and minced flesh from Alaska pollock and some underutilized finfish species from the Gulf of Mexico. J. Agric. Food Chem. 30(3); 1982; 477-80

SHELLFISH

- 2191 IKAWA (M), WEGENER (K), FOXALL (TL), SASNER (JJ) Jr, NOGUCHI (T) and HASHIMOTO (K). Use of a strong cation exchange resin column for the study of paralytic shellfish poisons. J. Agric. Food Chem. 30(3); 1982; 526-8

SHRIMP

- 2192 RADFORD (T) and DALISIS (DE). Analysis of formaldehyde in shrimp by high-pressure liquid chromatography. J. Agric. Food Chem. 30(3); 1982; 600-602

A method is described for the analysis of formaldehyde in shrimp. The procedure involves converting formaldehyde to its 2,4-dinitrophenylhydrazone which is analyzed by high-pressure liquid chromatography. Characteristics of the method include an estimated detection limit of 0.05 mg of formaldehyde/kg of shrimp, an average recovery of 72.3% at the 10 mg/kg level, and a total analysis time of 2 hours. The results of formaldehyde analyses of fresh shrimp obtained from typical commercial outlets, and also of shrimp maintained live in a laboratory aquarium, are reported. AA

- 2193 ALVAREZ (RJ) and KOBURGER(JA). Effect of *Planococcus citreus* on selected quality indices of *Penaeus* shrimp.
J. Food Prot. 44(5); 1981; 359-63

Selected biochemical and microbial changes in *Penaeus* shrimp inoculated with *Planococcus citreus* were examined to determine the potential of this organism to contribute to spoilage of shrimp. These changes indicate the capabilities of *P. citreus* in lowering the overall quality of *Penaeus* shrimp. AA

FROG

- 2194 SARVADEVA (A) and SRIKAR (LN). Changes in fatty acids of frog legs during frozen storage.
J. Food Technol. 17(1); 1982; 79-85

The changes in the fatty acids of frog leg meat during frozen storage were studied with column and gas-liquid chromatography. The major component of the lipids, the phospholipids constituted 90% of total lipids. 16:0, 18:0, 22:0 and 18:2 polyunsaturated fatty acid were the major fatty acids of the frog leg meat lipids. Short chain fatty acids were noticed to the extent of 10%. During frozen storage the proportion of phospholipids decreased, while that of neutral lipids increased. Since the total lipid content was constant, phospholipases were presumably responsible for this change. Alterations in the fatty acid composition of the neutral lipids during storage were consistent with such a hypothesis. AA

PROTEIN FOODS

Nil

FRUIT JUICES AND BEVERAGES

- 2195 SCHWALBE (N) and SCHOBERTH (CW). Introduction of a fruit juice mark in the paste board box.
Flussiges Obst. 47(9a); 1980; 470-1 (German)
- 2196 KOCH (HJ). Methods, experience and results of the utilization of secondary energy, shown by examples in the beverage industry.
Lebensmittelindustrie. 27(11); 1980; 499-504 (German)
- 2197 PIENDL (A). Consumption of alcoholic beverages and blood alcohol levels.
Brew. Dig. 57(8); 1982; 24-9

GRAPE

- 2198 MONTGOMERY (MW), REYES (FGR), CORNWELL (C) and BEAVEFS (DV). Sugars and acid analysis and effect of heating on colour stability of North-west Concord grape juice. J. Food Sci. 47(6); 1982; 1883-5, 1891

CITRUS

- 2199 ROE (B) and BRUEMMER (JH). Possible role of palmityl coenzyme A in citrus juice cells. J. Food Biochem. 6(1); 1982; 13-24
Mature oranges were analyzed for citrate synthase, acyl coenzyme A reductase, acyl coenzyme A and palmitaldehyde. Peeled oranges contained 9640 units citrate synthase and 150 units of acyl coenzyme A reductase per kg. The level of fatty acyl coenzyme A (3 μ M) was suggested as a potential effector of citrate synthase. Palmitaldehyde (0.04 μ M) was suggested as a product of the acyl coenzyme A reductase reaction with palmityl coenzyme A. AA

GRAPEFRUIT

- 2200 ROUSEFF (RL). Nomilin. A new bitter component in grapefruit juice. J. Agric. Food Chem. 30(3); 1982; 504-7
Nomilin, a new bitter component in grapefruit juice was found to range from 1.6 to less than 0.1 ppm in commercial grapefruit juices produced during the 1978-79 season. Early season fruits showed the highest concentrations of nomilin, which rapidly decreased with increasing fruit maturity. In November 1979, the nomilin/limonin ratio was 0.125 and by May it became only 0.04. For fruits harvested on the same day, nomilin and limonin contents of juice were lower in Duncan cultivar than in the Marsh seedless cultivar. BSN

ORANGE

- 2201 HASEGAWA (S), PATEL (MN) and SNYDER. Reduction of limonin bitterness in navel orange juice serum with bacterial cells immobilized in acrylamide gel. J. Agric. Food Chem. 30(3); 1982; 509-11
Limonin debittering of navel orange juice serum was successfully demonstrated with *Arthrobacter globiformis* cells immobilized in acrylamide gel. Treatment of 30 mL of serum (10-27 ppm of limonin), for instance on a 1.5 cm diameter column packed with 1.6 g of immobilized cells (16-mL bed volume) reduced limonin content by 70% or more. This column was used 17 times without losing its effectiveness. The treatment did not affect juice composition as measured by total acids, total soluble solids, pH, and sugars. 17-Dehydrolimonoate A-ring lactone was identified as the major metabolite, showing the involvement of limonin D-ring lactone hydrolase and limonoate dehydrogenase in the debittering process. AA

COFFEE

- 2202 ANON. Quality control of coffee. Indian Coffee. 46(1-2); 1982; 3-24
This is a summary of all the "do's" and "don't's" in the processing of coffee starting with the picking of berries, followed by curing, drying, hulling, grading and garbling, bulking, assessment and cup-tasting. KMD

TEA

- 2203 SRIVASTAVA (RAK), MATHUR (SN) and DEV CHAUDHURY (MN). Physiological aspects of different levels of nitrogen utilization in *Camellia sinensis* L. with respect to yield and quality of made teas. Indian J. Exp. Biol. 20(2); 1982; 152-5
- When tea bushes (*Camellia sinensis*) were fertilized at high N levels (300 Kg N/hectare), nitrogenous compounds in the leaves (protein, caffeine, and aminoacids) were less than the values obtained than when fertilization was done at the level of 200 kg N/hectare. This indicates repression of the enzymes involved in the biosynthesis of nitrogenous compounds. Glutamine, arginine, and theanine showed appreciable fluctuation and seemed to be involved in enzyme repression. The polyphenol content of the leaves, however, remained almost unaltered even though the N dose was varied. Thus, both yield as well as quality of made teas were favourable at an N dose of 200 kg/hectare. KMD

WINE

- 2204 HAYMAN (DC) and MONK (PR). Starter culture preparation for the induction of malolactic fermentation in wine. Food Technol. Aust. 34(1); 1982; 14,16-8
- Two cultures of *Leuconostoc oenos* have been compared for their ability to adapt to growth in wine by preparing starter cultures in grape juice media containing wine. An indigenous isolate showed adaptation and achieved faster growth rates when inoculated into wine. The rate of malic acid degradation in wine was inversely related to the concentration of wine used in preparing the starter culture. The presence or absence of malic acid is shown to be a poor index of ability of wines to support a malolactic fermentation. AA
- 2205 ESCHENBRUCH (R) and MOLAN. Can foaming during winemaking be controlled? Food Technol. Aust. 34(1); 1982; 32,34-5
- The present knowledge about foaming during winemaking is discussed. A modified method to assess the tendency of grape juices and wines to foam is briefly described. The separation and characterisation of foaming agents identifies three protein fractions. Yeast strains secrete these proteins, thus contributing to foaming. Grape juices contain naturally foaming fractions. Bottled wines have also been observed to foam. AA
- 2206 KUPINA (SA), KUTSCHINSKI (JL), WILLIAMS (RD) and DeSOTO (RT). A refined gas chromatographic procedure for the measurement of acetic acid in wines and its comparison with the distillation method. Am. J. Enol. Vitic. 33(2); 1982; 67-74
- Gas chromatography provided an accurate method for quick and precise analysis of acetic acid in wines. The complete separation of acetic acid from ethanol without 'tailing' or 'ghosting' was accomplished by column choice and by saturation of the nitrogen carrier gas with formic acid vapour. A column packed with Carbowax B coated with Carbowax 20M as the liquid phase was used. 1-Pentanol (n-Amyl alcohol), normally not found in wine, was used as the internal standard. Good correlation was observed when comparing GC acetic acid values with the conventional steam distillation method. The accuracy of the GC method was $\pm 1.2\%$ at the 0.04 g/100 mL acetic acid concentration level. The standard deviation for the most complex wine analyzed (red wine) was ± 0.0007 g/100 mL. AA
- 2207 SIMPSON (RF), MILLER (GC) and ORR (GL). Oxidative pinking of white wines: Recent observations. Food Technol. Aust. 34(1); 1982; 44,46-7
- In assays to gauge the pinking susceptibility and precursor content of young white wines, similar sample containers should be used, since the surface area of wine in contact with air affects the values obtained.

PVPP treatment is more effective than decolourising carbon or casein in reducing the risk of oxidative pinking. Addition of ascorbic or erythorbic acids protects the wine against oxidative pinking. Also, changes in pinking susceptibility and precursor content during vinification, processing and storage are reported. AA

- 2208 NAGEL (CW), AMISTOSO (JL) and BENDEL (RB). The effect of pH and titratable acidity on the quality of dry white wines. *Am. J. Enol. Vitic.* 33(2); 1982; 75-9

The effect of pH and titratable acidity adjustment on the scoring of a Sauvignon blanc and White Riesling was investigated. Inconsistent results were obtained with the Sauvignon blanc while the White Riesling showed definite trends that were statistically significant ($P < 0.05$). Lower titratable acidities were preferred at lower pH's. A pH of 3.3 did well in ranking over the titratable acidity range of 0.5-0.8%. Generally a titratable acidity of 0.9% or greater or pH greater than 3.4 received poor ranking. Quantitative descriptive analysis was used to determine the influence of pH on fruitiness, body, acidity and after-taste. The White Riesling with a pH of 3.0 was found to be more acid and have more aftertaste than the same wine at a pH of 3.6. The pH 3.6 Sauvignon blanc was found to have more body, whereas the pH 3.0 Sauvignon blanc was fruitier. AA

- 2209 FISCHER (E), MULLER (H), RAPP (A) and STEFFAN (H). Tritium and carbon-14 contents of wines of different vintage from the Northern and Southern hemisphere.

Z. Lebensmittel-Unters. Forsch. 171(4); 1980; 269-71 (German)

The carbon-14 and tritium radioactivity contents of upto 19 vintages of German and South African wines were compared. The influence of nuclear explosions on the South African wines is considerably smaller. The highest ^3H values were found in the vintage 1963 of the German wine with 5910 PCi/litre and in the vintage 1964 of the South African wine with 510 PCi/litre. AA

- 2210 DAVIS (CR), FLEET (GH) and LEE (TH). Inactivation of wine cork microflora by a commercial sulphur dioxide treatment. *Am. J. Enol. Vitic.* 33(2); 1982; 124-7

A commercial sulphur dioxide cork sterilization treatment was assessed microbiologically. The treatment inactivated, respectively, 80% and almost 100% of the bacterial and mold colony forming units present on the cork. *Penicillium* spp., predominant among the untreated cork microflora, were almost completely inactivated by the treatment. *Bacillus* spp. were found at much lower levels than molds on the corks, but appeared less susceptible to the treatment than *Penicillium* spp. Yeasts were rarely detected on the corks. AA

BEER

- 2211 KLIMOVA (SL). Czechoslovak Beers. Results of old tradition and modern technique. *Lebensmittelindustrie.* 27(11); 1980; 518-9 (German)

- 2212 KONAREV (A), KONSTANTINOVA (R) and STOJANOV (H). Trends of the development and concentration of the brewing industry in People's Republic of Bulgaria. *Lebensmittelindustrie.* 27(11); 1980; 519-21 (German)

- 2213 MARSCHALL (JJ), ALLEN (WG), DENAULT (LJ), GLENISTER (PR) and POWER (J). Enzymes in brewing. *Brew. Dig.* 57(9); 1982; 14,16,18,20,22

Discusses: carbohydrates; proteases; enzymes in adjunct cooker; enzymes in malt; enzymes in filtration aids; enzymes in light beer production; and enzymes in chill proofing. BSN

- 2214 MOJONNIER (T), NOTARDONATO (L) and PULAWSKI (C). Deoxygenation of water without vacuum.
MBAA Techn. Quart. 18(3); 1981; 136-9
- 2215 HARTMEIER (W) and WILLOX (IC). Immobilized glucose oxidase and its use for oxygen removal from beer.
MBAA Techn. Quart. 18(3); 1981; 145-9
- 2216 HAHN (CW). Efficient design of water deaeration units.
MBAA Techn. Quart. 18(3); 1981; 150-53
- 2217 SIDE (CE). Isinglass re-evaluated.
Brew. Dig. 57(10); 1982; 32,34-6
- 2218 J.L. A new metallic can for beer and gaseous beverages: the two-piece can.
Ind. Aliment. Agric. 98(1-2); 1981; 111-2 (French)
The manufacture of a can with a thick base (0.3-0.33 mm) and thin walls (0.10 mm) by drawing has been described. A 35-40% saving in metal has been achieved, when compared to the three-piece can. KMD
- 2219 FOSTER (RT), WEBER (K) and JANGAARD (NO). The effect of hop acids transformation on kettle utilization and finished beer flavour and aroma.
MBAA Techn. Quart. 18(3); 1981; 109-15
- 2220 JACOBSEN (T) and VOLDEN (R). Variations in trace elements in malt as shown by factor analysis.
MBAA Techn. Quart. 18(3); 1981; 122-5
- 2221 NITZ (S), MOZA (P) and KORTE (F). A capillary gas-liquid chromatographic method for determination of ethylenethiourea and propylenethiourea in hops, beer, and grapes.
J. Agric. Food Chem. 30(3); 1982; 593-6
A simple capillary gas chromatographic method was developed to assay propylenethiourea (PTU) and ethylenethiourea (ETU) residues in beer, hops, and grapes without derivatization. The limit of sensitivity was shown to be 0.005 ppm by using a flame photometric detector, FPD (sulphur mode, 394 nm). Residues of PTU/ETU in some commercial beers (1979) are also reported. AA
- 2222 MACIAS (JR) and ESPINOSA (I). Deterioration of quality of beer during storage in the distributor's warehouse.
MBAA Techn. Quart. 18(3); 1981; 131-5

OILS AND FATS

- 2223 LAWRENCE (BM). Progress in essential oils.
Perfum. Flavour. 6(6); 1982; 43-8
Discusses: coriander oil; Labdaum oil; lime oil; parsley oils - leaf, seed and herb; parsley leaf oil; parsley seed oil; parsley herb oil and pimento oil. BSN
- 2224 ELSON (CM), BEM (EM) and ACKMAN (RG). Determination of heavy metals in a menhaden oil after refining and hydrogenation using several analytical methods.
J. Am. Oil Chem. Soc. 58(12); 1981; 1024-6
- 2225 BANSAL (J) and DE MAN (JM). Effect of hydrogenation on some physical properties of canola oil.
J. Food Sci. 47(6); 1982; 2004-7, 2014

- 2226 ONG (SH), CHUAH (CC) and SOW (HP). The co-dominance theory: Genetic interpretations of analysis of mesocarp oils from *Elaeis guineensis*, *Elaeis oleifera* and their hybrids. J. Am. Oil Chem. Soc. 58(12); 1981; 1032-8
- 2227 HANNANT (G). Fat. What is it? J. Assoc. Publ. Anal. 20(4); 1982; 117-23
Discusses: potential for confusion; stricter definitions; analytical fat; suitability as legal definition; and analytical implications. BSN
- 2228 RAMANANARIVO (R), ARTAUD (J), ESTIENNE (J), PEIFFER (G) and GAYDOU (EM). Study on neutral lipid composition of Malagasy Zebu fats. I. Quantitative analysis of fatty acids and sterols. J. Am. Oil Chem. Soc. 58(12); 1981; 1038-41
The fatty acid and sterol compositions of different parts of Malagasy zebu (*Bos indicus*) were evaluated. Investigation by gas liquid chromatography using Carbowax 20 M revealed 35 fatty acids, mainly palmitic (24-27%), stearic (13-24%), and oleic (25-37%) acids. Odd numbered, iso and anteisofatty acids were also detected. Small differences in composition were observed between the hump and the kidney fats of *B. indicus*. Comparison between industrial tallow of *B. indicus* and *B. taurus* revealed slight differences in the stearic/oleic acid ratio (0.83 and 0.46, respectively). An OV 17 column was used to separate 9 sterols, mainly cholesterol (89-98%). β -Sitosterol was also found at lower concentrations in all the samples. AA
- 2229 LAMIKANRA (O). Sulphite-induced oxidation and browning of linoleic acid. J. Food Sci. 47(6); 1982; 2025-27, 2032
- 2230 KANAMOTO (R), WADA (Y), MIYAJIMA (G) and KITO (M). Phospholipid-phospholipid interaction in soyabean oil. J. Am. Oil Chem. Soc. 58(12); 1981; 1050-53
- 2231 GARTI (N), WELLNER (E) and SARIG (S). Effect of food emulsifiers on crystal structure and habit of stearic acid. J. Am. Oil Chem. Soc. 58(12); 1981; 1058-60

SPICES AND CONDIMENTS

- 2232 ABEYSINGHE (A). Processing of some minor export crops of Srilanka. Indian Cocoa, Arec. Spice. J. 5(3); 1982; 49-54
The present status of processing technology and probable areas of future development in the field of spices (Cinnamon, pepper, nutmeg, mace, clove, cocoa) of Srilanka have been discussed. MVG
- 2233 SCHULZ (JM) AND HERRMANN (K). Occurrence of catechins and proanthocyanidins in spices. V. Phenolics of spices. Z. Lebensmittel-Unters. Forsch. 171(4); 1980; 278-280
Catechins (especially (-) - epicatechin) and proanthocyanidins are found only in bay leaves and fruits, cinnamon, star anise, nutmeg, allspice and juniper. All the other spices contained neither catechins nor proanthocyanidins. AA
- 2234 ASADA (T), NISHIURA (Y), NAITO (K), OKADA (H) and MORI (K). New dual walled capsules produced by a multiple emulsion system (Studies on capsules Part II). J. Jpn. Soc. Food Sci. Technol. 28(3); 1981; 152-6 (Japanese)
A kind of dual walled capsule for encapsulation of oleoresins or essential oils was prepared by once spray drying process, and its characteristics was investigated. The dual walled capsules consist of some water-soluble parts in which oleoresins and essential oils are

encapsulated with gum arabic and dextrin, and some water-insoluble parts encapsulated with fats and oils. These capsules showed a different dissolution profile, compared with single walled capsules and dry soluble types. A portion of oleoresin held in the dual walled capsules was dissolved at low temperature and the rest of it at high temperature. Moreover, when the dual walled capsules were stored, the loss of oleoresin in these capsules was lesser than that observed in single walled capsules and dry soluble types. AA

MANGO GINGER

- 2235 SHANKARACHARYA (NB). Mango ginger.
Indian Cocoa. Arecanut. Spices. J. 5(4); 1982; 78-80
Aspects covered include botany, cultivation, composition, drying, essential oil content, use in preserve and candy, pickle and sauce and chemical properties. BSN

TURMERIC

- 2236 GEORGE (KM), BALAKRISHNAN (KV), CHANDRAN (CV), NARAYANA PILLAI (OG) and VERGHESE (J). On the extraction of oleoresin from turmeric.
Indian Spices. 18(2-4); 1981; 7-9
It was found that the low yields (5.7-5.9%) of oleoresin obtained from *Curcuma longa* in the earlier laboratory experiments was due to the use of low quality turmeric containing 3.3% curcumin. In the present study, the turmeric contained 6.4% curcumin and the efficiency of oleoresin extraction is in the order acetone > ethanol > ethylene dichloride, the percentage being 13.1, 12.1 and 9.2 respectively. The ability of the solvents to concentrate curcumin in the extractives is in the order, ethylene dichloride > ethanol > acetone. It was concluded that the above solvents display discrimination in with drawing oleoresin from the rhizomes. MVG
- 2237 JACOB (CV) and VARGHESE (J). ASTA method of curcumin evaluation: Need for change in adoption of standard.
Indian Spices. 18(2-4); 1981; 21
The American Spice Trade Association (ASTA), for its widely accepted method of assaying curcumin in turmeric, recommends Eastman Kodak Co. curcumin as standard. On rigorous screening of Eastman curcumin (sample 1179, lot No. ADB) by thin layer chromatography using different solvent systems, the sample displayed more than one spot in the chromatograms thus proving the apprehension that this chemical is unlikely to be homogenous. Further, it was also found on inquiry, that the sample contained only 90.1% curcumin (Assay by UV-VIS). MVG
- 2238 RAVINDRANATH (V) and CHANDRASEKHARA (N). Metabolism of curcumin - studies with (³H) curcumin.
Toxicology. 22(4); 1981; 337-44
Radioactivity was detectable in blood, liver and kidney following dosage with 400, 80 or 10 mg of (³H) curcumin. The major route of elimination of the label was the feces: the urinary excretion of the label was very low regardless of the dose. At the lower doses of 80 mg and 10 mg of (³H)-curcumin, most of the label was excreted within 72 hours while with 400 mg, considerable amounts of the label was present in the tissues 12 days after dosage. The percentage of curcumin absorbed (60-66% of the given dose) remained constant regardless of the dose administered. AA

NUTMEG

- 2239 DAVIS (DV) and COOKS (RG). Direct characterization of nutmeg constituents by mass spectrometry-mass spectrometry. J. Agric. Food Chem. 30(3); 1982; 495-504

CARDAMOM

- 2240 GUPTA (PN). Export potential in large cardamom. Indian Hortic. 26(4); 1982; 21-5,28
Sikkim in India produces about 6000 tonnes of dry capsules of large cardamom (*Amomum subulatum* Roxb). The prospects for and trends in the export of this produce has been outlined.

SENSORY EVALUATION

- 2241 MORTON (RH). Concordance testing with a nonparametric rating scale. Can. Inst. Food Sci. Technol. J. 13(3); 1980; 112-4

FOOD STORAGE

Nil

INFESTATION CONTROL AND PESTICIDES

- 2242 SCHULTEN (GGM). Post-harvest losses in Tropical Africa and their prevention. Food Nutr. Bull. 4(2); 1982; 2-9
- 2243 De LIMA (CPF). An index of quantitative and qualitative food loss. Food Nutr. Bull. 4(2); 1982; 10-12
- 2244 TYLER (PS). Misconception of food losses. Food Nutr. Bull. 4(2); 1982; 21-4
- 2245 MAJUMDER (SK). Approaches to the assessment of food losses. Food Nutr. Bull. 4(2); 1982; 25-32
- 2246 JOHNSON (DE) and BERNARD FREEDMAN. Toxicity of *Bacillus thuringiensis* Spo⁻Cr⁺ mutants for the European corn borer *Ostrinia nubilalis*. Appl. Environ. Microbiol. 42(2); 1981; 385-7
- 2247 STEELE (JE). Glycogen phosphorylase in insects (Review). Insect. Biochem. 12(2); 1982; 131-47
- 2248 MIAN (LS) and MULLA (MS). Biological activity of IGRs against four stored-product coleopterans. J. Econ. Entomol. 75(1); 1982; 80-85
Four insect growth regulators (IGRs), BAY SIR 8514(1-4-trifluoromethoxyphenyl)-3-(2-chlorobenzoyl) urea), diflubenzuron, methoprene, and MV-678 (2-methoxy 9-(p-isopropylphenyl)-2,6-dimethylnonane), applied at 5 ppm to wheat flour or grain, were evaluated against *Oryzaephilus surinamensis* (L.), *Tribolium castaneum* (Herbst), *Rhyzopertha dominica* (F.), and *Sitophilus oryzae* (L.). BAY SIR 8514 and diflubenzuron were highly active against the eggs and younger larvae of *O. surinamensis*, *T. castaneum*, and *R. dominica*. Methoprene, besides its ovicidal action against *O. surinamensis* and *R. dominica*, caused substantial mortality in the full-grown larvae of the three species. BAY SIR 8514

and methoprene also affected the subsequent progeny production of parent adults preexposed to IGR-treated food for 2 weeks. MV-678 appeared to be the least active compound tested. Diflubenzuron and methoprene had no adverse effects on the development of *S. oryzae* inside grain kernels infested with parent adults 1 day after grain was treated. However, in grain treated with BAY SIR 8514, diflubenzuron, and methoprene and infested with this insect after 12 months of post-treatment storage, the development of this species was arrested significantly. BAY SIR 8514 and diflubenzuron were more active against the eggs and younger larvae, with methoprene showing activity against all stages from egg to preemergence adults of this species. AA

- 2249 BARAK (AV) and HAREIN (PK). Trap detection of stored-grain insects in farm-stored, shelled corn.
J. Econ. Entomol. 75(1); 1982; 108-11
A modified version of trap for detecting insects infesting farm-stored, shelled corn was more effective than the conventional probing methods. KAR
- 2250 ANON. History and present status of pesticide usage in Japan.
Jpn. Pestic. Inf. (No 40; 1982; 53-65
- 2251 ANON. Short review of pesticides developed and registered in Japan.
(I) Chronological list of pesticides registered in Japan.
Jpn. Pestic. Inf. No. 40; 1982; 23-52
- 2252 NAGAE (Y). From development to registration of pesticides (I). Development stage.
Jpn. Pestic. Inf. No. 40; 1982; 3-16
- 2253 ANON. From development to registration of pesticides (II). Registration stage.
Jpn. Pestic. Inf. No. 40; 1982; 17-22
- 2254 BODNARYK (RP). The effects of pesticides and related compounds on cyclic nucleotide metabolism (Review).
Insect. Biochem. 12(6); 1982; 589-97
- 2255 GRAY (LE) Jr., KAVLOCK (RJ), CHERNOFF (N), GRAY (JA) and McLAMB (J). Perinatal toxicity of endrin in rodents. III. Alterations of behavioural ontogeny.
Toxicology. 21(3); 1981; 187-202
- 2256 BARRY (TL), PETZINGER (G) and GRETCH (FM). GC-MS identification and analytical behaviour of pirimiphos-methyl in imported foods.
Bull. Environ. Contam. Toxicol. 27(4); 1981; 524-8
- 2257 PESTEMER (W) and MANN (W). Herbicide residues in some herbs.
Z. Lebensmittel Unters. Forsch. 171(4); 1980; 272-7 (German)
Residue occurrence in the case of 14 herbicides in 6 herbs (borage, dill, garden-chervil, garden cress, anise and sorrel) is discussed with the help of analyses (from field trials carried out in two laboratories). The limits of the determinations and recoveries have been given. KMD
- 2258 MARCUS (C) and LICHTENSTEIN (EP). Interactions of naturally occurring food plant components with insecticides and pentobarbital in rats and mice.
J. Agric. Food Chem. 30(3); 1982; 563-8

BIOCHEMISTRY AND NUTRITION

- 2259 HARPER (WJ) and MOODY (ME). Enzymatic cleaning of cellulose acetate membrane reverse osmosis systems.
J. Food Prot. 44(5); 1981; 337-40
- 2260 PATTABIRAMAN (TN). Non-enzymatic glucosylation of proteins: Methodology and clinical applications.
Arogya. 8(2); 1982; 118-34
- 2261 OKITANI (A) and KATO (H). Aminopeptidases of muscles and cultivated plants.
J. Jpn. Soc. Food Sci. Technol. 28(3); 1981; 160-68 (Japanese)
- 2262 FELLMAN (JK), ARTZ (WE), TUSSINARI (PD), COLE (CL) and AUGUSTIN (J). Simultaneous determination of thiamin and riboflavin in selected foods by high-performance liquid chromatography.
J. Food Sci. 47(6); 1982; 2048-50, 2067
A high-performance liquid chromatographic (HPLC) system that makes it possible to accurately and simultaneously quantitate low levels of riboflavin and thiamin (thiochrome) from single extracts following oxidation and sample preconcentration steps is described. Several food matrices were analyzed and the results compared to the AOAC method now in use. Within the range of standard deviations, both methods gave comparable values. This method is rapid, accurate, sensitive and economical, making it attractive to those who require routine analysis of thiamin and riboflavin. AA
- 2263 KAUSHAL (GP), SITAL (JS) and BHATIA (IS). Studies on taramira seed (*Eruca sativa* Lam.) proteins.
J. Agric. Food Chem. 30(3); 1982; 431-5

TOXICOLOGY AND HYGIENE

- 2264 ANDERS (E), BAGNELL (CR) Jr., KRIGMAN (MR) and MUSHAK (P). Influence of dietary protein composition on lead absorption in rats.
Bull. Environ. Contam. Toxicol. 28(1); 1982; 61-7
- 2265 WISE (A). Protective action of calcium phytate against acute lead toxicity in mice.
Bull. Environ. Contam. Toxicol. 27(5); 1981; 630-33
- 2266 OBANA (H), HORI (S), KASHIMOTO (T) and KUNITA (N). Polycyclic aromatic hydrocarbons in human fat and liver.
Bull. Environ. Contam. Toxicol. 27(1); 1981; 23-7
- 2267 MULLER (D), KLEPEL (H), MACHOLZ (RM), LEWERENZ (HJ) and ENGST (R). Electroneurophysiological studies on neurotoxic effects of hexachlorocyclohexane isomers and gamma-pentachlorocyclohexene.
Bull. Environ. Contam. Toxicol. 27(5); 1981; 704-6
- 2268 ROZMAN (K), ROZMAN (T) and GREIM (H). Enhanced fecal elimination of stored hexachlorobenzene from rats and rhesus monkeys by hexadecane or mineral oil.
Toxicology. 22(1); 1981; 33-44
- 2269 D'AOUST (J-Y). Update on preenrichment and selective enrichment conditions for detection of *Salmonella* in foods.
J. Food Prot. 44(5); 1981; 369-74

- 2270 MOATS (WA). Update on salmonella in foods: Selective plating media and other diagnostic media.
J. Food Prot. 44(5); 1981; 375-80
- 2271 THOMASON (BM). Current status of immunofluorescent methodology for salmonellae.
J. Food Prot. 44(5); 1981; 381-4
- 2272 HARTMAN (PA) and MINNICH (SA). Automation for rapid identification of salmonellae in foods.
J. Food Prot. 44(5); 1981; 385-93
- 2273 COX (NA), BAILEY (JS) and THOMSON (JE). Comparison of micro-ID and Minitek-serology systems for rapid identification of *Salmonella*
J. Food Prot. 44(6); 1981; 442-4
- 2274 BRYAN (FL). Current trends in foodborne salmonellosis in the United States and Canada.
J. Food Prot. 44(5); 1981; 394-402
- 2275 COX (NA), THOMSON (JE) and BAILEY (JS). Minitek inoculum broth for testing indole production by enterobacteriaceae.
J. Food Prot. 44(6); 1981; 445-6
- 2276 CHIRIFE (J), VAAMONDE (G) and SCARMATO (G). On the minimal water activity for growth of *Staphylococcus aureus*.
J. Food Sci. 47(6); 1982; 2054-7
- 2277 GREENBERG (NA) and MAHONEY (RR). Production and characterization of β -galactosidase from *Streptococcus thermophilus*.
J. Food Sci. 47(6); 1982; 1824-28, 1835
- 2278 MONTVILLE (TJ) and CONWAY (LK). Oxidation-reduction potentials of canned foods and their ability to support *Clostridium botulinum* oxigenesis.
J. Food Sci. 47(6); 1982; 1879-82
Oxidation-reduction potentials (Eh) of canned foods ranged from -18 to -438 mV. Foods packed in glass had higher redox potentials than those packed in cans. Only 4 out of 26 products tested reached positive redox values after exposure to air for 24 hour at 4 C. Inoculated containers of mushrooms, whole corn, cream corn, asparagus, beef gravy, kidney beans, green beans, cream of mushroom soup, cheddar cheese soup, and lima beans supported toxin production by *C. botulinum*; potatoes and beets did not. AA
- 2279 NG (TK) and ZEIKUS (JG). Comparison of extracellular cellulase activities of *Clostridium thermocellum* LQRI and *Trichoderma reesei*, QM 9414.
Appl. Environ. Microbiol. 42(2); 1981; 231-40
- 2280 SEKI (S), HIGO (K) and ISHIMOTO (M). Studies on nitrate reductase of *Clostridium perfringens*. III. Comparison of nitrate reductase from five strains of *C. perfringens*.
J. Gen. Appl. Microbiol. 28(6); 1982; 541-50
- 2281 ALVAREZ-BARREA (V), PEARSON (AM), PRICE (JF), GRAY (JI) and AUST (SD). Some factors influencing aflatoxin production in fermented sausages.
J. Food Sci. 47(6); 1982; 1773-5
- 2282 DEVRAJ (H), RADHA SHANMUGASUNDARAM (K) and SHANMUGASUNDARAM (ERB). Neurotoxic effect of patulin.
Indian J. Exp. Biol. 20(3); 1982; 230-31
Patulin is a secondary metabolite of *Aspergillus* and *Penicillium* which are common as food contaminants. *Penicillium patulum* produced typical neurotoxic signs, including convulsions and tremors, when fed to rats. KMD

GENERAL

- 2283 SRIVASTAVA (JC). Technological services rendered by CSIR. *Invent. Intell.* 17(11): 1982; 448-58
- 2284 HOLZINGER (TW). Quality assurance: National and international. *J. Food Prot.* 44(7); 1981; 553-5

FOOD PROCESSING AND PACKAGING

- 2285 THOMPSON (D). Response surface experimentation. *J. Food Process. Preserv.* 6(3); 1982; 155-88
- 2286 KAMEYAMA (Y), LAI (FS), SAYAMA (H) and FAN (LT). The risk of dust explosions in grain processing and handling facilities. *J. Agric. Eng. Res.* 27(3); 1982; 253-9
- 2287 SHARP (JR). A review of low temperature drying simulation models. *J. Agric. Eng. Res.* 27(3); 1982; 169-90
Discusses: low temperature drying models; equilibrium models; partial differential equation (p.d.e.) models; logarithmic models; model validation; applications of low temperature drying models; and relationships and data required simulation. BSN
- 2288 STEFANOVICH (AF) and KAREL (M). Kinetics of beta-carotene degradation at temperatures typical of air drying of foods. *J. Food Process. Preserv.* 6(4); 1982; 227-42
Degradation of β -carotene was studied in a model system at temperatures between 60 and 80 C in order to formulate a kinetic model useful in the optimization of air drying processes. Two previously reported kinetic analyses were used: a first order model and a simplified free radical reaction model. In both cases the models fit the experimental data but neither is entirely satisfactory since the kinetic parameters reflected an initial concentration dependence. This dependence disappeared at high carotene initial concentrations and also when the thickness of the lipid layer was increased either by using a support with a lower specific surface area or by adding a saturated fatty acid. These results indicate that at high concentrations oxygen diffusion becomes a limiting factor. When using food systems, a first order model seemed a better choice for the simulation of the carotene degradation. Results could not be directly related to those of the model system, probably because the model was too simple, and did not contain the pro- and anti-oxidant components naturally occurring in foods. AA
- 2289 FUJII (S) and NAKAI (S). Optimization of data transformations for linearization. *Can. Inst. Food Sci. Technol. J.* 13(4); 1980; 188-91
- 2290 ANON. Packaging brightens up Britain's cloudy economy. *Packag. Eng.* 27(12); 1982; 124-30
- 2291 LUCIANO (RA) and PETERS (JW). Solving the packaging machinery equation. *Packag. Eng.* 27(12); 1982; 43-8

- 2292 PETERS (JW). Cost squeeze spurs ideas on food package options. *Packag. Eng.* 27(1); 1982; 35-9
- 2293 MULVANEY (S) and RIZVI (SSH). Retort pouch processing idea yields better nutrient value. *Packag. Eng.* 27(10); 1982; 92-4
- 2294 ANON. Bundling, pallet shrink ideas complement stretch methods. *Packag. Eng.* 27(9); 1982; 29-32
- 2295 PETERS (JW). High-strength paper aim-lighter multiwall bags. *Packag. Eng.* 27(9); 1982; 61-62
- 2296 ANON. Heated roller modification cuts stretch-wrap costs. *Packag. Eng.* 27(12); 1982; 85-6
- 2297 BERTRAND (K). Thermoformed polypropylene gains allies in packaging. *Packag. Eng.* 27(9); 1982; 44-6
- 2298 PETERS (JW). Corrugated structures: Ideas answer multiple requirements. *Packag. Eng.* 27(10); 1982; 49-53
- 2299 BORKMANN (K) and PANNASCH (K). Investigations on the increase of the output of bottling plants by proper dimensioning of the conveying systems and magazines. *Lebensmittelindustrie.* 27(12); 1980; 557-63 (German)
- 2300 BERTRAND (K). PVC bottles stage comeback in FDA-regulated uses. *Packag. Eng.* 27(10); 1982; 80-82
- 2301 UEDA (O). Cleaning and medicament sterilization as sanitation on aseptic packaging of food. *J. Jpn. Soc. Food Sci. Technol.* 28 6); 1981; 338-46
- 2302 BERTRAND (K). Printing technology: old plus new yields quality, economy. *Packag. Eng.* 27(8); 1982; 31-5
Discusses the impact of new techniques like flexo pre-printing, electron-beam curing, screened heat-transfer and decals brighten surfaces on quality and economy of packaging materials. BSN

FOOD ENGINEERING AND EQUIPMENT

- 2303 TALATI (NM). Solar water heater-cum-hot water reservoir. A new design. *Invent. Intell.* 17(4); 1982; 169-70

ENERGY IN FOOD PROCESSING

- 2304 KARKI (MMS). Bio-mass: An affordable energy source. *Khadigramodyog.* 28(5); 1982; 261-4
- 2305 BISWAS (DK), BHANDARI (MM) and COLACO (CA). Energy management in process industry: Principles and a strategy for conservation. *Chem. Age India.* 34(1); 1983; 9-17

- 2306 AWASTHI (SK), SRIVASTAVA (SN) and PANDEY (GN). Energy conservation in chemical and allied industries. *Chem. Age India* 34(1); 1983; 19-25
- 2307 PADMANABHAN (S) and SRINIVASAN (PR). Energy conservation: The role of equipment manufactures. *Chem. Age India*. 34(1); 1983; 27-36
- 2308 JAIN (BC). Renewable sources of energy: Their relevance to developing countries and efforts at Jyoti's energy division. *Chem. Age India*. 34(1); 1983; 43-9

FOOD CHEMISTRY AND ANALYSIS

- 2309 EVANS (WH) and DELLAR (D). Evaluation of an inductively coupled plasma emission direct-reading spectrometer for multiple trace element analysis of foodstuffs. *Analyst*. 107(1278); 1982; 977-93
- An inductively coupled plasma optical emission direct-reading polychromator (ICP-OES) has been evaluated for multiple trace element analysis of foodstuffs. Major trace elements (copper, iron, manganese and zinc) and trace elements (cadmium, lead, nickel, chromium, arsenic and tin) have been considered. For each element, random bias has been exemplified for routine practice, in both sulphuric acid and hydrochloric acid standard solutions, by the standard deviations for instrument noise, repeatability and reproducibility of measurement. Systematic bias originating from direct interferences has been categorised and relevant corrections have been calculated. To avoid the worst excesses of these interferences and to concentrate the trace elements to levels that permit measurement, a method involving isolation by chelation, extraction, oxidation and solubilisation in fixed acid solution has been used. Six of the elements are amenable to this treatment: copper, manganese zinc, nickel, cadmium and lead. When this treatment is applied to digests of a selection of foodstuffs no element satisfies the criterion of accuracy required for quantitative analysis in dietary surveys of foodstuffs. The results display comparable confidence intervals to those obtained by flame atomic-absorption spectrometric measurement, however, for the first four of the elements listed. AA
- 2310 CHAPMAN (BR) and GOLDSMITH (IR). Determination of chloride, sodium and potassium in salted foodstuffs using ion-selective electrodes and the dry sample addition method. *Analyst*. 107(1278); 1982; 1014-8
- The "dry sample addition" method of ion-selective potentiometry is described. This incremental or spiking method requires the addition of a known mass of solid sample directly to a standard solution containing the ion to be measured. Dissolution of the sample produces a change in electrode potential which is related to the sample composition. Dry sample addition has been applied to the analysis of foodstuffs containing up to 2.8% of salt. The chloride, sodium and potassium concentrations are determined by Philips solid-state and plastic ion-selective electrodes. Comparison of this method with titrimetry and atomic-absorption spectrometry gave satisfactory results. The advantages gained in cost, speed of analysis and reliability using ion-selective measurement are discussed. AA
- 2311 FOGG (AG), BSEBSU (NK) and ABDALLA (MA). Flow injection voltammetric determination of nitrite by reduction at a glassy carbon electrode in acid c bromide or chloride media. *Analyst*. 107(1278); 1982; 1040-46
- Nitrite can be determined by reduction at a glassy carbon electrode

held at +0.3 V versus a saturated calomel electrode by flow injection voltammetry at concentrations of greater than 1×10^{-6} M by direct injection of sample solution (25 l) into an eluent 3.2 M in hydrochloric acid and 20% m/V in potassium bromide. Alternatively, the nitrite may be pre-reacted with acidic bromide before injection and determined at concentrations above 1×10^{-7} M. The use of an acidic chloride medium is less satisfactory. AA

- 2312 RHYS (AT) and WINFIELD (SA). Determination of monosodium glutamate in food using high-performance liquid chromatography and fluorescence detection. *Analyst*. 107(1278); 1982; 1092-4

An HPLC method for estimation of monosodium glutamate in foods has been developed which involves column dansylation and fluorescence detection. Dansylchloride C5-dimethylaminonaphthalene-1-sulphonyl chloride or DNS-cl reacts with primary and secondary amino groups resulting in formation of fluorescent derivatives. These may be conveniently separated by liquid chromatography, while excellent sensitivity is recorded by fluorescent detection. BSN

FOOD LAWS AND REGULATIONS

Nil

FOOD MICROBIOLOGY

- 2313 GRECO (G) Jr. and GIANFREDA (L). Enzyme stabilization by linear chain polymers in ultrafiltration membrane reactors. *Biotechnol. Bioeng.* 23(10); 1981; 2199-210
- 2314 ZETELAKI-HORVATH (K) and VAS (K). Effect of oxygen transfer rate on the composition of the pectolytic enzyme complex of *Aspergillus niger*. *Biotechnol. Bioeng.* 23(10); 1981; 2231-41
- 2315 DEESLIE (WD) and CHERYAN (M). A CSTR-hollow fiber system for continuous hydrolysis of proteins. Performance and kinetics. *Biotechnol. Bioeng.* 23(10); 1981; 2257-71
- 2316 NITHIANANDAM (VS), SRINIVASAN (KSV), JOSEPH (KT) and SANTAPPA (M). Preparation and properties of immobilized amyloglucosidase. *Biotechnol. Bioeng.* 23(10); 1981; 2273-82
- 2317 ESENER (AA), ROELS (JA) and KOSSEN (NWF). On the statistical analysis of batch data. *Biotechnol. Bioeng.* 23(10); 1981; 2391-6
- 2318 VAN BEUSEKOM (CNJ), De KOK (HE) and ROELS (JA). A method for the determination of dissolved carbon dioxide. *Biotechnol. Bioeng.* 23(10); 1981; 2397-401
- 2319 MULCAHY (LT), SHIEH (WK) and LaMOTTA (EJ). Experimental determination of intrinsic denitrification kinetic constants. *Biotechnol. Bioeng.* 23(10); 1981; 2403-6

- 2320 BRAUN (R) and HUSS (S). Anaerobic digestion of distillery effluents. *Process Biochem.* 17(4); 1982; 25-7
- 2321 BERG (RW), SANDINE (WE) and ANDERSON (AW). Identification of a growth stimulants for *Lactobacillus sanfrancisco*. *Appl. Environ. Microbiol.* 42(5); 1981; 786-8

YEAST

- 2322 AGAR (DW) and BAILEY (JE). Continuous cultivation of fission yeast: Classical and flow microfluorometry observations. *Biotechnol. Bioeng.* 23(10); 1981; 2217-29
- 2323 AGAR (DW) and BAILEY (JE). Continuous cultivation of fission yeast: Analysis of single-cell protein synthesis kinetics. *Biotechnol. Bioeng.* 23(10); 1981; 2315-31
- 2324 ADMASSU (W), KORUS (RA), HEIMSCH (RC) and LEMMEL (SA). Growth of *Saccharomyces fibuligera* in a continuous-stirred-tank fermentor. *Biotechnol. Bioeng.* 23(10); 1981; 2361-71
- 2325 SHIMIZU (N), UENO (M) and ODAWARA (Y). Baker's yeast growth with high concentrations of carbon dioxide in exit gas. *J. Ferment. Technol.* 60(6); 1982; 487-91

The effect of carbon dioxide on the growth of baker's yeast during cultivation in an oxygen rich environment was investigated. The growth of baker's yeast decreased with high concentrations of carbon dioxide in the exit gas and increased with low concentrations. When the carbon dioxide concentration in the exit gas increased from 3 to 43 per cent, the growth yield of baker's yeast decreased 20 per cent in the constantly fed-batch culture. The baker's yeast converted glucose into carbon dioxide at a high rate when the concentration of carbon dioxide in the exit gas was high. AA

- 2326 BAYER (K) and FUEHRER (F). Computer coupled calorimetry in fermentation. *Process Biochem.* 17(4); 1982; 42-5
- 2327 EHRLICH (GG), GOERLITZ (DF), BOURELL (JH), EISEN (GV) and GODSY (EM). Liquid chromatographic procedure for fermentation product analysis in the identification of anaerobic bacteria. *Appl. Environ. Microbiol.* 42(5); 1981; 878-85

MUSHROOM

- 2328 MEMUNA HAQUE and CHAKRABARTI (CH). A study on availability of iron in mushrooms. *Indian J. Nutr. Dietet.* 19(7); 1982; 203-211

FOOD ADDITIVES

- 2329 ADCOCK (LH). Non-volatile additives: More tests on migration. *Packag. Eng.* 27(12); 1982; 76-9
- 2330 KABARA (JJ). A new preservative system for food. *J. Food Safety.* 4(1); 1982; 13-25

Discusses: monoglycerides and their antimicrobial properties; phenolic lipophilic food additives; chelating agents as preservative potentiators; other food ingredients as preservatives; and the "preservative systems" approach to food protection. BSN

- 2331 SHIBASAKI (I). Food preservation with nontraditional antimicrobial agents. *J. Food Safety*. 4(1); 1982; 35-58

Discusses: amino acids, peptides and related products; simple and complex alcohols; fatty acids and their esters; spices; antimicrobial products of nonenzymatic browning reactions; antimicrobial plant constituents; and food additives. BSN

- 2332 LAHELLEC (C), FUNG (DYC) and CUNNINGHAM (FE). Growth effect of sorbate and selected antioxidants on toxigenic strains of *Staphylococcus aureus*. *J. Food Prot.* 44(7); 1981; 531-4

Effect of potassium sorbate with and without added antioxidants on *Staphylococcus aureus* 196, S-6, 137 and 326 in a liquid system was evaluated. We found (a) potassium sorbate at 1, 3, and 5% levels in combination with BHA, BHT, PG (50 and 100 ppm) exerted greater bactericidal and bacteriostatic effects on *S. aureus* strains at pH 5 than at pH 7; at pH 6 the effect was more pronounced at 3 and 5% compared with 1% sorbate. (b) TBHQ was highly inhibitory to *S. aureus* strains with or without the addition of sorbate, (c) in combination with sorbate. BHA exerted greater bactericidal effects compared with BHT and PG, (d) higher concentration of antioxidants exerted more bactericidal and bacteriostatic effects on test organisms, (e) *S. aureus* S-6 was more resistant than 196, 326, and 137 in the presence of sorbate and antioxidants and (f) shake cultures of *S. aureus* grew better than static cultures in the presence of sorbate and BHA. AA

- 2333 BRIESHORN (CH) and MAHLMEISTER (K). Improved determination limits of phenolic antioxidants by differential pulse voltametry. *Z. Lebensmittel Unters. Forsch.* 171(5); 1980; 348-51 (German)

CEREALS

- 2334 WIESER (H), SEILMEIER (W) and BELITZ (HD). Comparative investigations of partial amino acid sequences of prolamines and glutelins from cereals. II. Fractionation of glutelins. *Z. Lebensmittel Unters. Forsch.* 171(6); 1980; 430-6 (German)

RICE

- 2335 McFARLANE (JA). Damage to milled rice by *Psocids*. *Trop. Stored Prod. Inf.* No.44; 1982; 3-10

- 2336 ZAKIUDDIN ALI (S) and BHATTACHARYA (KR). Studies on pressure parboiling of rice. *J. Food Sci. Technol. (India)* 19(6); 1982; 236-42

The long cooking time and hard texture of pressure-parboiled rice have been investigated. Paddy adjusted to various moisture contents (12-30%) was steamed under different pressures (0-3 kg/cm²) for different times (5-80 min.). Translucence index (% rice area not covered by white belly), gelatinization index (equilibrium moisture content attained by paddy immediately after steaming when soaked in water at room temperature or immediate EMC-S),

retrogradation index (% fall in EMC-S of rice after drying and milling as compared to immediate EMC-S), cooking resistance index (% fall in water uptake during cooking of parboiled as compared to raw rice), colour and head-rice recovery were studied. Degree of each property increased with increase in moisture content, pressure and time of steaming. Complete parboiling (100% translucence) could be achieved even at very low grain moisture (12-20%) when steamed under high pressure. However, such rice was too hard to cook. A translucence index of about 80% was the maximum in pressure-parboiled rice that was acceptable in terms of cooking quality and colour. Its milling breakage was negligible. With this modification, pressure-parboiling process will be acceptable. KAR

- 2337 NARASIMHA (HV), ANANTHACHAR (TK), SHANKARA (R), GOPAL (MS) and DESIKACHAR (HSR). Development of a continuous process for making rice flakes. *J. Food Sci. Technol. (India)*. 19(6); 1982; 233-5

A continuous process for making rice flakes (beaten rice, Avalakki, Poha) from paddy has been developed. The soaked paddy is roasted in a continuous roaster, immediately shelled in a modified centrifugal type sheller and gently polished in a cone type rice polisher. It is flaked in a heavy duty roller flaker. Several 250 kg batches were run by the continuous process and the average yield of rice flakes is about 70%, which is 6-7% higher than that obtained by the traditional process. KAR

- 2338 BRYAN (FL), BARTLESON (CA) and CHRISTOPHERSON (N). Hazard analysis, in reference to *Bacillus cereus*, of boiled and fried rice in Cantonese-style restaurants. *J. Food Prot.* 44(7); 1981; 500-512

The amount of *Bacillus cereus* in rice, and the water activity and temperatures of rice at each stage of processing have been evaluated. Recommendations for preventing the growth of *B. cereus* in cooked or fried rice are: (a) to cook only small batches of rice at intervals during the day; (b) to hold cooked rice at or above 55 C (131 F); (c) to cool cooked rice in shallow pans in layers less than 9 cm thick; and (d) to fry rice so that every grain is certain to reach a temperature of atleast 74 C (165 F). KMD

- 2339 TANIGUCHI (M), KOMETANI (Y), TANAKA (M), MATSUNO (R) and KAMIKUBO (T). Production of single-cell protein from enzymatic hydrolyzate of rice straw. *Eur. J. Appl. Microbiol. Biotechnol.* 14(2); 1982; 74-80

The components of rice straw, pretreated with sodium chlorite, cellulose and hemicellulose were solubilized with culture filtrate of *Pellicularia filamentosa* or *Trichoderma reesei*. The ratio of glucose to total sugar in the solution obtained from the cellulose component with the culture filtrate of *Pellicularia filamentosa* was approximately twice that of *Trichoderma reesei*. Ten yeast strains (*Candida utilis*, *C. tropicalis*, *C. guilliermondii*, *C. parapsilosis*, *Torulopsis xylinus*, *Trichosporon cutaneum*, *Debaryomyces hansenii*, *Rhodotorula glutinis*, *Saccharomyces fragilis* and *Saccharomyces cerevisiae*) were cultivated as test organisms for single cell protein (SCP) production on sugar solutions obtained from the straw, cellulose and hemicellulose components, pretreated with the culture filtrate of *Pellicularia filamentosa*. Sugar consumption, in terms of total sugar and cell yield, of the culture with the sugar solution obtained from pretreated straw were; 70% and 6.8 g/l for *Candida tropicalis*, 56% and 6.4 g/l for *Torulopsis xylinus*, 76% and 10.1 g/l for *Trichosporon cutaneum*, and 74% and 7.6 g/l for *Candida guilliermondii*. In addition, the highest consumption with respect to total sugar (87%) and the best dry cell yield (15.6 g/l) were observed with the culture of *Trichosporon cutaneum* using the sugar solution obtained from the hemicellulose component. AA

WHEAT

- 2340 ANON. Influence of time in uniform water distribution during dampening of wheat. *Indian Miller*. 13(3); 1982; 5-10
- 2341 MORRISON (WR). Lipids in dissected wheat and other cereal grains. *J. Am. Oil Chem. Soc.* 59(2); 1982; 102
- 2342 STUBBS (M) and ABOOD (F). Oviposition by *Sitophilus granarius* (L.) (Coleoptera: Curculionidae) in insect contaminated wheat. *J. Stored Prod. Res.* 19(1); 1983; 51-6
- Experiments were carried out to determine whether *Sitophilus granarius* would lay eggs in contaminated wheat if clean wheat was available as an alternative. When grain was contaminated by allowing male or virgin female *S. granarius* to feed upon it for 1, 2 or 4 weeks, both laboratory strains tested preferred to lay on clean wheat. One strain showed a stronger preference for clean wheat over male- than female-contaminated wheat. The other strain, which in culture sometimes produces more than one offspring per grain, rejected male- and female-contaminated grain equally strongly. For both strains, the preference for clean wheat was greater when the period of contamination was longer. This behaviour could reduce the frequency of more than one egg being laid in one grain which could lead to mortality of the young stages through competition within the grain. AA
- 2343 GHALY (TF) and TAYLOR (PA). Quality effects of heat treatment of two wheat varieties. *J. Agric. Eng. Res.* 27(3); 1982; 227-34
- As part of a research programme on the thermal disinfestation of wheat, 2 Australian wheat varieties (Olympic and Spica) conditioned to 2 moisture levels, 12% and 14% (w.b.), were heat treated in a 340 mm diameter fluidized bed with air at temperatures of 60, 80, 100 and 120 C for periods of between 120 and 5 minutes and an air flow of 145 l/s. Germination, micro-baking loaf volume and turbidity tests were done on samples of the treated wheat. Results showed that the effect of temperature was far more potent than the time of heating. They also showed that the moisture content of the seed is an important factor controlling the extent of damage and that Spica was more susceptible to heat damage than Olympic. Results also showed that although the 3 measures used to indicate the onset of heat damage generally followed the same trend, some doubt could exist with the turbidity test, whilst germination and baking tests correlated well and either could be used alone. AA
- 2344 BAINS (GS). Wheat processing and milling technology. *Indian Miller*. 13(3); 1982; 27-37
- Review covers the various aspects of wheat processing and milling including production of standard atta; suitability of wheats for whole meal; roller flour milling; protein displacement milling; durum wheat milling; starch gluten industry; snack food production; newer wheat products; bulgur wheat, peeled and world wheat, wheat beverages and other miscellaneous products from wheat. MVG
- 2345 PFEILSTICKER (K) and ROEUNG (S). Isolation and characterisation of L-ascorbic acid oxidase (EC 1.10.3.3) from wheat flour. *Z. Lebensmittel Unters. Forsch.* 171(6); 1980; 425-9 (German)

- 2346 DRONZEK (BL), DEXTER (JE) and MATSUO (RR). A scanning electron microscopy study of wheat gluten. *Can. Inst. Food Sci. Technol. J.* 13(4); 1980; 162-6

- 2347 SODA (T), KATO (J), KIRIBUCHI (S) and AOKI (H). Properties of buckwheat proteins from the standpoint of food processing. *J. Jpn. Soc. Food Sci. Technol.* 28(6); 1981; 297-302 (Japanese)

The protein content of the 3rd flour (obtained at the final stage of crushing) was around 5 times as high as that of the 1st flour (obtained at the initial stage), and 80% of the former protein was water-soluble. Physical properties of acid-precipitated protein (APP) from the water extract resembled those of wheat gluten. Especially, a remarkably high viscoelasticity was found in the APP from the 1st flour. The extent of the protein-protein interaction induced by heat treatment of the water extract from the 1st flour was far extensive as compared with that of the water extract from the 3rd flour. Viscosity of the proteins from the 1st flour was higher than that of the proteins from the 3rd flour, e.g., the former APP showed around 10 times higher value than the latter APP. Viscosity of the proteins generally decreased by the addition of NaCl. Intrinsic viscosity of the APP was 10-40 times as high as that of soyabean globulin. Taking the above results and the observation by scanning electron micrography into consideration, the relationship between the buckwheat proteins and the formation of buckwheat noodles was discussed. AA

- 2348 JYOTI BALA, MIGLANI (SS) and BAKSHI (MPS). Comparative physiological cost of chapati making in different postures. *Indian J. Nutr. Dietet.* 19(6); 1982; 191-5

6 female students made chapatis by squatting and standing postures; the pulmonary ventilation rate, carbon-di-oxide production and energy expenditure were significantly higher for kneading the dough than for making chapatis in both the postures. The carbon-di-oxide production and energy expenditure were significantly higher in squatting than in standing posture for kneading the dough and for making chapatis. BSN

BARLEY

- 2349 JUDD (PA). The effects of high intakes of barley on gastrointestinal function and apparent digestibilities of dry matter, nitrogen and fat in human volunteers. *J. Plant Food.* 4(2); 1982; 79-88

MILLETS

MAIZE

- 2350 VAN CAUWENBERGE (JE), BOTHAST (RJ) and KWOLEK (WF). Thermal inactivation of eight *Salmonella* serotypes on dry corn flour. *Appl. Environ. Microbiol.* 42(4); 1981; 688-91

Dry heat was used to inactivate *Salmonella newington*, *Salmonella typhimurium*, *Salmonella anatum*, *Salmonella kentucky*, *Salmonella cubana*, *Salmonella seftenberg*, *Salmonella thompson*, and *Salmonella tennessee* in corn flour at 10 and 15% moisture. The flour was spray inoculated at 10^5 *Salmonella* cells per g and then stored at 49 C (120 F); viable *Salmonella* cells

were counted on Trypticase (BBL Microbiology Systems) soy agar plates every 30 minutes for the first 4 hours and then at 4-hours intervals for 20 additional hours of storage. After 24 hours, 99.9% of all *Salmonella* cells were killed. *S. thompson* and *S. tennessee* were more resistant to heat inactivation than the other serotypes. Naturally occurring contamination by *Salmonella* spp. in dry food products could be significantly reduced with this treatment. AA

PULSES

PEA

- 2351 SELMAN (JD) and ROLFE (EJ). Effects of water blanching on pea seeds. II. Changes in vitamin C content. *J. Food Technol.* 17(2); 1982; 219-34

Laboratory scale experiments were conducted to elucidate the main mechanisms responsible for changes in the proportions of ascorbic acid (AA) and dehydroascorbic acid (DHA) in peas during water blanching. Studies utilized hand-harvested peas from specially grown Dark Skinned Perfection (DSP), Swan and Swift cultivars. The influence of pea size/maturity, blanch time and damage to the pea were studied over the temperature range 35-97 C. With increasing DSP pea size/maturity, the proportion of AA oxidized increased, and the proportion of AA leached into the water decreased when blanching between 45 and 65 C. Maximum AA oxidation occurred at 60 C and leaching became the prime mode of loss above 70 C. Leaching of AA from DSP peas increased almost linearly from 40 to 97 C. Damaging peas by bruising and slitting the testa, induced enhanced AA oxidation below 60 C and allowed immediate leaching of vitamin C largely as DHA even at the lowest blanch temperatures. Results suggested that the oxygen content of the tissues was a factor limiting the amount of AA oxidation. Cultivars Swift and Swan contained higher proportions of DHA particularly in the testa tissues, and calculations indicated that greater proportions of vitamin C were leached as DHA. A negligible proportion of AA was oxidized and some 28% of the initial AA was leached into the water when undamaged DSP peas were blanched at 97 C for 1 minute. Bruised plus slit peas lost significantly more AA than undamaged peas when blanched at 97 C. Further evidence indicated that the micropyle serves as a major pathway for leaching losses. AA

DRY BEAN

- 2352 CHANG (KC) and SATTERLEE (LD). Chemistry of dry bean proteins. *J. Food Process. Preserv.* 6(4); 1982; 203-25

Discusses: physico-chemical properties; nutritional quality; approaches for improving protein quality; processing and its effects on protein quality; methodology for study of nutritional quality; and recommendations for further research. BSN

LOCUST BEAN

- 2353 ODUNFA (SA). Carbohydrate changes in fermentating locust bean during IRU preparation. *J. Plant Food.* 4(2); 1982; 105-10

Oligosaccharides were the most abundant carbohydrates in the unfermented African locust beans. Flatus-forming oligosaccharides - stachyose and

raffinose and sucrose were the main constituents. During the first 24 hours of fermentation the quantities of the oligosaccharides decreased significantly. The reducing sugars increased during the first 12 hours but these decreased at later hours of fermentation. The reducing sugars detected in the unfermented and fermented locust beans were similar; these were galactose, glucose and fructose. The activities of galactosidase and galactosidase were highest at 24 hours from the start of fermentation while the peak of sucrase activity was at 36 hours. AA

MOTH BEAN

- 2354 PRATIMA SHASTRI (N), GOND (RB), DESHPANDE (AP), MESHARAM (JR) and RAO (BY). *In vitro* digestibility of parched moth beans. *Indian Food Packer*. 36(3); 1982; 62-6

Presoaking of seeds of moth beans (*Phaseolus aconitifolius*) for 4 and 8 hours, followed by roasting at 250 C gave a crunchy and acceptable parched product. Moth bean contained 61.7% of water soluble total proteins, which was reduced by 50% on as against parching bean. Parched beans are more susceptible for hydrolysis by trypsin and papain. About 55.5-70% of total starch gets gelatinised on parching. The study has shown that parching leads to a longer storage life and beans may be conveniently stored in air tight and moisture proof package for further use as a precooked legume powder. BSN

LENTIL

- 2355 JINDAL (S), SONI (GL) and SINGH (R). Effect of feeding of lectins from lentils and peas on the intestinal and hepatic enzymes of albino rats. *J. Plant Food*. 4(2); 1983; 95-103

The lectins from lentils and peas after isolation and purification have been fed to albino rats and their effects on the various intestinal and hepatic enzymes have been studied after 7 days and 14 days of feeding. The feeding of the lectins resulted in significant growth retardation of the animals. In general, the lectins decreased the activities of intestinal disaccharidases and proteolytic enzymes and increased the activities of the intestinal alkaline and acid phosphatases and Ca^{++} -ATPase. The activities of some hepatic dehydrogenases decreased after feeding of the lectins. The decreased activities of intestinal disaccharidases and proteases may be partly responsible for the growth inhibitory effect of the ingested lectins but after some time the animals seem to adapt to the inimical effect of lectins. AA

OILSEEDS AND NUTS

- 2356 KAMEL (BS), DeMAN (JM) and BLACKMAN (B). Nutritional, fatty acid and oil characteristics of different agricultural seeds. *J. Food Technol.* 17(2); 1982; 263-9

COTTONSEED

- 2357 PANDY (SN) and SURI (LK). Cyclopropenoid fatty acid content and iodine value of crude oils from Indian cottonseed. *J. Am. Oil Chem. Soc.* 59(2); 1982; 99-101

Cyclopropenoid fatty acid (CPFA) and iodine value (IV) of oils extracted from 30 varieties of cottonseed belonging to 4 botanical species, *Gossypium arboreum*, *G. berbaceum*, *G. birsutum* and *G. barbadense*, have been reported. The CPFA determined by HBr titration method ranged from 0.65 to 1.51%. The IV of the oils ranged from 93.3 to 111.2. CPFA contents were significantly different among the species and nonsignificant within the species. The mean values of CPFA for different species were 0.67 (*G. barbadense*), 0.83 (*G. birsutum*), 1.14, (*G. berbaceum*) and 1.40% (*G. arboreum*). There was no correlation between IV and CPFA content. AA

- 2358 HRON (RJ) Sr. and GRACI (AV) Jr. Effect of ultrasonic comminution on liquid classification of cottonseed protein and gossypol pigment glands. *J. Am. Oil Chem. Soc.* 59(1); 1982; 25-8

Slurries of pin-milled full-fat and flaked, extracted cottonseed were ultrasonically comminuted in hexane and liquid-classified using laboratory differential settling techniques. Sonication of full-fat cottonseed slurries increased the liquid-classified protein fraction recovery from 25.9% (nonsonicated control) to over 60%, while the protein content of the fraction remained basically constant at 67%, and free gossypol increased slightly from 0.027 to 0.032%. Sonication of flaked, solvent-extracted (fat-free), slurried cottonseed yielded a 28% classified fraction containing 72% protein and 0.032% free gossypol. Although it was demonstrated on laboratory scale only, ultrasonic comminution may make the price of edible cottonseed protein concentrates produced from glanded seed (via a process such as the liquid cyclone process) competitive with other edible protein products. AA

LUPIN

- 2359 CERNING-BEROARD (J) and FILIATRE-VEREL (AF). Characterization and distribution of soluble and insoluble carbohydrates in Lupin seeds. *Z. Lebensmittel Unters. Forsch.* 171(4); 1980; 281-5 (German)

MUSTARD

- 2360 KERBER (E) and BUCHLOH (G). Contents of sinapine in mustard. *Z. Lebensmittel Unters. Forsch.* 171(5); 1980; 355-6 (German)

The content of sinapine in 16 commercial samples of mustard has been determined and found to be in the range of 4.4-7.1 $\mu\text{M/g}$ fresh weight. The bitter tasting sinapine is only of minor importance for the taste of mustard. AA

- 2361 GROVER (MR), BHATTACHARYA (SK) and MATHEW (TV). Studies on shelf life of vegetable oils packed in used tin containers. *J. Food Sci. Technol. (India)* 19(6); 1982; 268-70

Mustard oil, sesame (til) oil and groundnut oil were packed in new as well as once-used and repeatedly-used tin containers and stored under ambient room conditions for a period of about one year. The quality was assessed by organoleptic score, acid value and peroxide value. It was found that the keeping quality of these vegetable oils packed in new tin containers remained generally stable upto one year in case of mustard and til oil and 8 months in case of groundnut oil. These oils when packed in once-used containers retained their stability for 4-5 months and when packed in repeatedly-used containers, they were not acceptable beyond a period of 3 months. AA

RAPESEED

- 2362 RUTKOWSKI (A), GWIAZDA (S) and KRYGIER (K). Sulphur compounds affecting processing of rapeseed. *J. Am. Oil Chem. Soc.* 59(1); 1982; 7-11

A characteristic feature of cruciferous oilseeds is the presence of high levels of sulphur compounds as sulphur containing aminoacids and glucosinolates which determine the nutritional value of rapeseed meal and affect processing factors in oil mills. During rapeseed processing, products of glucosinolate splitting are liberated and attack metal; as a result of which, a specific sulphur corrosion of oil mill equipment develops. The most exposed parts are the cooker, toaster and transporters of wet meal. The results of industrial investigation of sulphur corrosion are described and the sensitivity to corrosion of several construction sheets during rapeseed processing is considered. A high content of sulphur-containing compounds in starting oil significantly depressed the nickel catalyst activity and influenced the kinetics of rapeseed oil hydrogenation. Removal of these compounds by refining and its influence on the rate of oil hydrogenation are discussed. AA

- 2363 HSIEH (F-H), DAUN (JK) and TIPPLES (KH). The effect of rapeseed oil added to control grain dust on the quality of wheat. *J. Am. Oil Chem. Soc.* 59(1); 1982; 11-5

The effect of spraying edible rapeseed oil on controlling dust in barley, oat, rye and wheat has been investigated. Both the amount of rapeseed oil deposited and initial dust level govern the dust reduction level, whereas the type of grain is immaterial. Regardless of the initial dust concentration, about 80% dust could be reduced with only 0.05% rapeseed oil addition. When the initial dust level exceeded 750 mg/m³, dust reduction could reach 90%. Although some dust adhered to the wheat kernels after rapeseed oil application, except for slight deteriorations in flour ash and colour, other flour analytical properties, physical dough properties, and milling and baking qualities were unaffected. AA

- 2364 DAUN (JK). The relationship between rapeseed chlorophyll, rapeseed oil chlorophyll and percentage green seeds. *J. Am. Oil Chem. Soc.* 59(1); 1982; 15-48

Oils with high levels of chlorophyll have become a major problem in the Canadian crushing industry. It was not possible to compare visually the colour of samples of rapeseed oil from various crushing plants in Western Canada with the nickel sulphate standard used as a trade standard. Comparison was easy using samples of oil prepared from seed in the laboratory. The difficulty in comparison was probably caused by conversion of green coloured chlorophyll to russet-coloured pheophytin in the crushing process. An "apparent chlorophyll" standard with a maximum of 20 ppm (measured by AOCS cc 13d-55) is recommended. AA

SOYABEAN

- 2365 CHAVEN (C), HYMOWITZ (T) and NEWELL (CA). Chromosome number, oil and fatty acid content of species in the Genus *Glycine* subgenus *Glycine*. *J. Am. Oil Chem. Soc.* 59(1); 1982; 23-5

The results reported herein do not favour interspecific hybridization attempts between the soyabean and the species in the subgenus *Glycine* as a

means of producing a low linolenic acid soyabean. However, the wild species germ plasm might have other chemical or agronomic characteristics of use to the soyabean breeder. KMD

- 2366 GHALY (TF) and SUTHERLAND (JW). Quality aspects of heated-air drying of soyabeans. *J. Stored Prod. Res.* 19(1); 1983; 31-41

Samples of 300 g of soyabean seed, variety Forrest, conditioned to 14, 16 and 18% moisture content (m.c.; w.b.), were dried for 4 hours in a small batch fluidized-bed rig with a test section of 120 mm diameter and air flow rate set at 0.03 kg/s. Air inlet temperatures of 40, 50, 55, 60, 65, 70 and 80 C, were used to determine the effects on quality. Conditioned and unconditioned samples, together with samples dried in the bed for 4 hours at room temperature, served separately as controls. Samples of 25 g of the conditioned seed, sealed in test tubes, were heated for 4 hours in an air oven at 40, 45, 50, 55 and 60 C to study the effect of heating at a constant m.c. Seed germination and seedling vigour clearly indicated the onset of heat damage and showed that no single criterion was more sensitive than any other. Safe drying air temperatures of 65, 60 and 55 C were obtained for initial moisture contents of 14, 16 and 18% respectively. Heating soyabeans upto 60 C at a fixed m.c. increased the susceptibility to heat damage. Oil yield, free fatty acid content and fatty acid composition were not affected by any of the heat treatments. The peroxide value, however, showed some increase at temperatures about 50 C. Fluidizing at room temperature did not affect germination. The colour of crude oil, after heat bleaching, for 50-80 C heat treatments was paler than the controls, while 40 C gave very dark colour. Degumming of oils followed by refining removed all detectable phospholipids from all samples and produced oils paler in colour, when heat bleached, except for 80 C at 16 and 18% m.c. which produced oils slightly but noticeably darker. Soyabeans were found to dry slowly compared to sunflower seed and rapeseed, and the logarithmic drying model was fitted to the various drying curves. Computer program DRIER was modified to be applicable to soyabeans and some runs were carried out for a farm batch radial-flow drier. Results indicated the advantage of using a high inlet air temperature provided that seed quality is not affected. AA

- 2367 BROWN (BD), WEI (LS), STEINBERG (MP) and VILLOTA (R). Minimizing protein insolubilization during thermal inactivation of lipoxygenase in soyabean cotyledons. *J. Am. Oil Chem. Soc.* 59(2); 1982; 88-92

The objective was to develop a procedure for inactivating lipoxygenase in soyabean cotyledons without losing protein solubility. Recommended conditions were adjustment of cotyledon moisture to 16.3% with pH 9.8 buffer, and then heating in steam for about 10 seconds at temperatures of 91 C and above. 99% of the lipoxygenase could be inactivated with retention of over 70% protein solubility. AA

- 2368 RHEE (JS) and SHIN (MG). Analysis of phosphatidylcholine in soy lecithins by HPLC. *J. Am. Oil Chem. Soc.* 59(2); 1982; 98-9

A simple and rapid high pressure liquid chromatographic method with RI detector was developed to determine the content of phosphatidylcholine in soy lecithins. AA

- 2369 GUPTA (K), DHINDSA (KS) and WAGLE (DS). Electrophoretic and solubility characteristics of proteins in soyabean varieties. *J. Food Sci. Technol. (India)*. 19(6); 1982; 264-7

Two hybrid varieties of soyabean H-19 (HM-1 x Bragg) and H-20 (HM-1 x Ankur) along with their parents and two other varieties (Pk 71-21 and

Pk 71-6) were studied for their protein fractions including albumin, globulin, prolamine and glutelin. The range in the values of contents (% of total protein) among the varieties were: albumin 28.8-40.6, globulin 4.7-12.6, prolamine 1.8-3.7 and glutelin, 22.4-30.4. H-20 variety contained highest amount of albumin. Proteins were separated by polyacrylamide gel electrophoresis and scanned in a Beckman spectrophotometric scanner at 600 nm. Maximum number of bands (11 no.) were obtained in H-19 and Bragg while Ankur contained only 8 bands. AA

- 2370 SALT (DJ), LESLIE (RB), LILLFORD (PJ) and DUNNILL (P). Factors influencing protein structure during acid precipitation : A study of soya proteins. *Eur. J. Appl. Microbiol. Biotechnol.* 14(3); 1982; 144-8
- 2371 PRATTLE (CA) and STANLEY (DW). Protein-phytate interactions in soyabeans. I. Localization of phytate in protein bodies and globoids. *J. Food Biochem.* 6(4); 1982; 243-53
- A study was made of whole soyabeans isolated protein bodies and a fraction consisting of globoid inclusions separated from protein bodies by centrifugation in order to observe the cellular location of phytate and to determine any indication of protein-phytate interaction within the soybean cell. Microstructural and chemical evidence demonstrated phytic acid to be located in the protein bodies of the soybean, likely in the form of a soluble protein-phytate salt with significant amounts specifically deposited in globoid inclusions. The probable existence of a protein-cation-phytate complex *in situ* was shown by gel filtration in which calcium and phosphorus was found to coelute with soluble proteins. The proteins involved in this interaction were tentatively identified as the 7S soybean fraction. AA
- 2372 PRATTLE (CA), STANLEY (DW) and VAN DE VOORT (FR). Protein-phytate interactions in soyabeans. II. Mechanism of protein-phytate binding as affected by calcium. *J. Food Biochem.* 6(4); 1982; 255-71
- 2373 PRATTLE (CA), STANLEY (DW), SMITH (TK) and VAN DE VOORT (FR). Protein-phytate interactions in soyabeans. III. The effect of protein-phytate complexes on zinc bioavailability. *J. Food Biochem.* 6(4); 1982; 273-82
- 2374 SNYDER (JM), MOUNTS (TL), SCHOLFIELD (CR) and DUTTON (HJ). Laboratory-scale continuous hydrogenation: Effect of pressure. *J. Am. Oil Chem. Soc.* 59(1); 1982; 19-22
- 2375 OKADA (Y), YOSHII (H), KATO (H) and TAKEUCHI (T). On the improvement of quality of low salt soyabean miso. Study on the reduction of salt concentration in fermented food part. VIII. *J. Jpn. Soc. Food Sci. Technol.* 28(4); 1981; 194-200 (Japanese)

The effect of rice added to soyabean on the quality was studied by using 4 types of low salt soyabean-miso : miso of soyabean-koji only (control, II), miso of koji prepared by mixing cooked soyabean and rice (III), miso of the mixture of soyabean-koji and rice-koji (IV), and miso of the mixture of soyabean-koji and cooked rice. (1) In miso using rice with soyabean (III~V), sugar, contents, γ % in colour and aroma components were increased in comparison with miso using soyabean only (II). The former were also highly evaluated than the latter by the sensory test. (2) Depending on the employing of rice, some differences were observed in enzymatic activities and colour of miso. That is, III had the highest protease activity and IV, V showed higher γ % value in colour. (3) No remarkable

differences were observed in the enzymatic activities in miso except for protease, and microflora during ripening among IV V. AA

- 2376 GUPTA (K) and DHINDSA (KS). Fatty acid composition of oil of different varieties of soyabean. *J. Food Sci. Technol. (India)* 19(6); 1982; 248-50

Five varieties of soyabean viz 'HM-1', 'Bragg', 'Ankur', 'PK 71-6', and 'PK 71-21' and two crosses viz 'H-19' (HM-1 x Bragg) and 'H-20' (HM-1 x Ankur) were analysed for fatty acid composition and free fatty acids. Free fatty acids and total unsaturated fatty acids ranged from 0.5 to 1.4 and 84.0 to 92.4% respectively. Palmitic, stearic and linoleic acids varied from 5.6 to 11.0, 1.7 to 6.0 and 7.6 to 18.0% respectively. 'HM-1' contained the highest amount of oleic acid. KAR

- 2377 IMPOOLSUP (A), BHUMIRATANA (A) and FLEGEL (TW). Isolation of alkaline and neutral proteases from *Aspergillus flavus* var. *columnaris*, a soy sauce koji mold. *Appl. Environ. Microbiol.* 42(4); 1981; 619-28
- 2378 SURDY (TE) and HAAS (SO). Modified enrichment - serology procedure for detection of salmonellae in soy products. *Appl. Environ. Microbiol.* 42(4); 1981; 704-7

SUNFLOWER SEED

- 2379 BHATTACHARYYA (P), SAMNI (RC), DAS GUPTA (SK), CHANDRASEKHARA RAO (T) and LAKSHMINARAYANA (G). Effects of date of sowing and harvesting on characteristics and fatty acid composition of sunflower seeds. *J. Food Sci. Technol. (India)* 19(6); 1982; 246-8

Sunflower (Var. EC 68414) seed was sown during the pre-kharif (mid-April, May 1st week), Kharif (May 3rd week, June 1st week) and rabi (November 4th week) seasons of 1978 and were harvested at 6-day intervals starting from the 75th day after sowing for the pre-kharif and kharif crops and at 7-day intervals starting from the 90th day after sowing for the rabi crop. With advance in harvesting date in all the seasons, the 100-seed weight increased and the contents of moisture decreased, oil increased, oleic acid decreased and linoleic acid increased. The 100-seed weight oil content and linoleic acid content were highest for the longer duration (118 days) rabi crop than for the other two crops of shorter duration (99 days). Protein content did not vary significantly. Sowing from third week of May yielded oleic rich oil. Sowing in first week of June yielded lowest oil content. KAR

- 2380 KABIRULLAH (M) and WILLS (RBH). Functional properties of acetylated and succinylated sunflower protein isolate. *J. Food Technol.* 17(2); 1982; 235-49

Sunflower protein isolate was acylated with acetic and succinic anhydride. Succinylation changed the electrophoretic mobility, decreased the lysine and chlorogenic acid content and bulk density, increased the aqueous solubility, shifted the isoelectric point and increased the absorption, emulsification and foaming properties. Acetylation improved the functional properties of the protein to a much lesser extent. Implication of these changes is discussed with reference to food applications. AA

PECAN

- 2381 COLE (RJ), DORNER (JW), COX (RH), HILL (RA), CLUTER (HG) and WELLS (JM). Isolation of citreoviridin from *Penicillium charlesii* cultures and molded pecan fragments. *Appl. Environ. Microbiol.* 42(4); 1981; 677-81

GROUNDNUT

- 2382 PATTEE (HE), GIESBRECHT (FG), DICKENS (JW), WYNNE (JC), YOUNG (JH) and MOZINGO (RW). The seed hull maturity index as an estimator of yield and value of Virginia-type peanuts. *Peanut Sci.* 9(1); 1982; 27-30
- 2383 WYNNE (JC). Variation in milling quality of peanuts. *Peanut Sci.* 9(1); 1982; 30-33
- 2384 TROEGER (JM). Peanut drying energy consumption. A simulation analysis. *Peanut Sci.* 9(1); 1982; 40-44
- An analysis of various factors affecting energy consumption and drying time of peanuts was performed, using a computer simulation model. The analysis included consideration of ambient conditions, dryer controls, and initial peanut moisture. The analysis indicated that the airflow rate used in many commercially available farm dryers is necessary to adequately dry high moisture peanuts, but that a lower airflow rate would be adequate for low-moisture peanuts. A lower airflow rate would reduce energy consumption. Increasing the temperature rise of the drying air would speed drying but would also lower milling quality. Energy consumption was lowest early in the drying season when ambient drying potential was high. AA
- 2385 HOVIS (AR), YOUNG (CT) and TAI (PYP). Variation in total amino acid percentage in different portions of peanut cotyledons. *Peanut Sci.* 9(1); 1982; 44-6
- Six peanut (*Arachis hypogaea* L.) varieties were analyzed for amino acid concentration among four consecutive sections across the two cotyledons. Significant differences were found among varieties (average 60% of total variation), among seeds (average 15% of total variation), and for some amino acids between sections (average 2.7% of total variation). With the exception of glutamic acid, proline, and histidine, varietal differences accounted for most of the variability found. Therefore, it appears that partial seed analysis for amino acids may be useful in genetic studies and for breeding selections. AA
- 2386 SANDERS (TH), LANSDEN (JA), GREENE (RL), STANLEY (J), DREXLER and WILLIAMS (EJ). Oil characteristics of peanut fruit separated by a nondestructive maturity classification method. *Peanut Sci.* 9(1); 1982; 20-23
- A nondestructive peanut pod maturity classification method, Pod Maturity Profile (PMP), based on visual examination of the colour and structural characteristics of pod mesocarp after partial removal of pod exocarp, was used to separate freshly harvested peanut pods into maturity classes. The separations made non destructively were compared with those made by a method involving the examination of internal pericarp and testa characteristics. The groups separated by the two methods were closely related. In oil from the PMP classes, colour decreased, free fatty acid content decreased, iodine value remained approximately constant, and oven stability of the extracted oil increased with increasing maturity. Total oil contents and fatty acid profiles had consistent but more complex

relationships with maturity. The data indicate that the PMP method allows consistent and reproducible classification of peanut fruit maturity. AA

- 2387 McGAUGHEY (WH). Evaluation of commercial formulations of *Bacillus thuringiensis* for control of the Indian meal moth and almond moth (Lepidoptera: Pyralidae) in stored inshell peanuts. *J. Econ. Entomol.* 75(4); 1982; 754-757

In laboratory tests, a dust formulation of *Bacillus thuringiensis* Berliner was superior to a WP formulation in protecting farmers' stock (in-shell) peanuts from Indianmeal moth, *Plodia interpunctella* (Hubner), and almond moth, *Ephestia cautella* (Walker), infestation. The WP did not completely eliminate moth emergence at rates as high as 625 mg/kg when applied as either a bulk or surface layer treatment. Efficacy of the WP was not improved by more uniform application. The dust nearly eliminated moth emergence when used as a surface layer or bulk treatment at 500 mg/kg. At equivalent dosages, the dust limited moth emergence and peanut damage to <5%, but the WP permitted ca. 23% moth emergence and peanut damage. AA

- 2388 LANSDEN (JA). Aflatoxin inhibition and fungistasis by peanut tannins. *Peanut Sci.* 9(1); 1982; 17-20

Three fractions of tannins were isolated from Florunner peanut testa. Both the growth of *Aspergillus parasiticus* (NRRL 2999) on PDA agar and production of aflatoxins in liquid culture were inhibited by the tannins. The ability to inhibit growth was inversely related to the ability to inhibit aflatoxin production for each fraction. Two types of tannin assays were inadequate as predictors of the biological activity of the tannin fractions. AA

- 2389 McWATTERS (KH). Peanut and cowpea meals as a replacements for wheat flour in cake-type doughnuts. *Peanut Sci.* 9(1); 1982; 46-50

Meals processed from partially defatted peanuts, untoasted and toasted, and from dry cowpeas were used to replace wheat flour at 10, 20, and 30% levels in cake-type buttermilk doughnuts. The legume meals were darker and larger in particle size than wheat flour and produced batters with a "grainy" appearance. With the exception of untoasted peanut meal at the 30% level which produced a sticky batter that was difficult to cut, the legume and 100% wheat flour control batters were well suited to mechanical cutting, dispensing, and drying. Legume meal batters produced fewer doughnuts per batch, of higher average weight, than control batters. Gardner colour values of doughnuts were influenced more by the addition of toasted peanut meal than by the other test meals. Sensory quality scores for appearance, colour, aroma, texture, and flavour were acceptable for control and test doughnuts, indicating that peanut and cowpea meals are compatible ingredients for use in this type of bakery product. Techniques to restrict excessive fat absorption during doughnut frying are needed, however. AA

CHESTNUT

- 2390 BERRY (SK). Fatty acid composition and cyclopropene fatty acid content of china-chestnuts (*Sterculia monosperma*, Ventenat). *J. Am. Oil Chem. Soc.* 59(1); 1982; 57-8

The China-chestnuts (*Sterculia monosperma*, Ventenat) were examined for their fatty acid composition by gas liquid chromatography, infrared and nuclear magnetic resonance spectroscopy. The oil in nuts contained

cyclopropene fatty acids (CPFA) determined as silver nitrate derivatives of their esters.. The values (area %) for the major fatty acids as methyl esters were 23.47% C16:0, 1.25% C16:1, 2.56% C18:0, 24.89% C18:1, 18.24% C18:2, 5.40% dihydrosterculic, 3.21% C18:3 + C20:0 and 19.15% sterculic. The proportion of CPFA in the oil did not decrease upon cooking the nuts. AA

PISTACHIO NUT

- 2391 LUH (BS), WONG (WS) and EL-SHIMI (NE). Effect of processing on some chemical constituents of pistachio nuts. *J. Food Quality*. 5(1); 1981; 33-41
The effect of processing (blanching, drying and roasting) on pistachio nuts showed that blanching in hot water caused the loss of fatty acids, sugars and amino acids. The magnitude of loss was blanching > roasting > drying. Unsaturated fatty acids are more susceptible to change during processing; the combined loss of oleic acid and linoleic acids was 22.29% of that present in raw nuts. KAR

MAFURA NUT

- 2392 FUPI (VWK) and MORK (PC). Mafura nut oil and meat. Processing and purification. *J. Am. Oil Chem. Soc.* 59(2); 1982; 94-8
The seeds of the tropical tree known as mafura (*Trichilia emetica*) contain significant amounts of oil and protein. So far, commercial use of the mafura seeds has been prevented by the presence of a strong bitter and emetic taste, as well as a brownish colour in both oil and meal. A refining procedure which gives edible oil with acceptable organoleptic properties has been developed. The raw meal has been extracted with aqueous alcohol to give a debittered meal with a protein content of about 36%. The amino acid composition of the meal was found to be comparable to that of other vegetable food proteins, except for a relatively low content of sulphur containing amino acids. The brown colour has been shown to result from browning reactions taken place during storage and processing. Most of the colour may be removed by repeated treatments with dilute sodium hydroxide, followed by bleaching with earth and activated carbon. AA

TUBERS AND VEGETABLES

- 2393 SUSANTA ROY (K) and KHURDIYA (DS). Keep vegetable fresh in summer. *Indian Hortic.* 27(1); 1982; 5-6
Based on the principle of evaporative cooling, four cool storage chambers made of low cost materials have been designed for use by rural masses and economically backward class. The first one is made of porous bricks and river bed sand; the other three are made of ordinary earthen pot surrounded by sand which is placed in a tank of brick or an ordinary wooden box or an empty fruit basket. The chambers can store tinda, chilli, bitter gourd and lady's finger for 6 days which otherwise became unmarketable within 1 or 2 days. MVG

ONION

- 2394 NAITO (S), YAMAGUCHI (N) and YOKOO (Y). Antioxidative activities of vegetables of *Allium* species. Studies on natural antioxidant. Part II. J. Jpn. Soc. Food Sci. Technol. 28(6); 1981; 291-6 (Japanese)

A study was undertaken to evaluate the antioxidative activities of several vegetables of *Allium* species. Results obtained were as follows: (1) While every vegetable of *Allium* species tested (*Allium sativum* L., *A. cepa* L., *A. tuberosum* Rottler, *A. fistulosum* L. var. *caespitosum* makino, *A. fistulosum* L., *A. bakeri* Regel) exhibited apparent antioxidative activities in a linoleic model system, only *A. sativum* L., and *A. cepa* L. showed the activities against a minced pork model system. (2) *A. sativum* L. and *A. tuberosum* Rottler contained higher amounts of sulphides than others tested. (3) A larger amount of S-alkyl-L-cystein sulphoxide was found in *A. sativum* L., *A. bakeri* Regel, *A. tuberosum* Rottler, *A. fistulosum* L. than in other samples tested. (4) Boiling or microwave heating increased antioxidative activities of the vegetables of *Allium* species and decreased their flavour contents. AA

- 2395 OBI (SKC) and UMEZURIKE (GM). Pectic enzyme activities of bacteria associated with rotted onions (*Allium cepa*). Appl. Environ. Microbiol. 42(4); 1981; 585-9

GARLIC

- 2396 PUSHPENDRAN (CK), DEVASAGAYAM (TPA) and EAPEN (J). Age-related hyperglycaemic effect of diallyl disulphide in rats. Indian J. Exp. Biol. 20(5); 1982; 428-9

Diallyl disulphide (DADS), the major constituent of the essential oil of garlic, has a hyperglycaemic effect in rats. The effect is greater and longer-lasting in suckling rats than in the adult or old animals. Plasma glucose level of the adults and old rats is nearly normal 4 hours after treatment with DADS₁ which is not the case in suckling rats. KMD

- 2397 DEVASAGAYAM (TPA), PUSHPENDRAN (CK) and EAPEN (J). Diallyl disulphide induced changes in microsomal enzymes of suckling rats. Indian J. Exp. Biol. 20(5); 1982; 430-32

Diallyl disulphide (DADS), a major component of garlic oil, significantly increases NADH and NADPH - dependent microsomal mono-oxygenases in sucklings rats, at various time intervals after treatment. DADS increases glucose-6-phosphatase and adenosine triphosphatase activities at a longer time (4 hours) after treatment. KMD

RADISH

- 2398 SENGUPTA (P) and ROY (BR). Studies on the composition and characteristics of Indian radish seed oil. J. Food Sci. Technol. (India) 19(6); 1982; 254-7

Different varieties of radish seed (*Raphanus sativus* L.) were analysed for oil content and the oil extracted therefrom for chemical characteristics, fatty acid composition by GLC, glyceride composition by pancreatic lipase hydrolysis and GLC, essential oils and phospholipids. The study showed that the oil is similar in composition to mustard oil; this

indicates its use as a possible substitute for, or an adulterant in, mustard oil. It has less of erucic acid than mustard oil, but is comparable to mustard oil pungency. KAR

POTATO

- 2399 CHUNG (I) and HADZIYEV (D). Tuber and starch characteristics of Alberta grown potatoes. *Can. Inst. Food Sci. Technol. J.* 13(4); 1980; 143-53

- 2400 ANAND (JC), MAINI (SB) and BRIJESH DIWAN. A simple way to preserve potato for chips making. *J. Food Sci. Technol. (India)* 19(6); 1982; 267-8

Potato tubers were stored successfully up to one year in a solution containing 0.6% acetic acid and 0.2% potassium metabisulphite. Chips prepared from this retained better colour during storage as well as after frying. Substitution of acetic acid with citric, tartaric or malic acid affected the cooking quality of tubers in the same way as in acetic acid. Reduction of various chemical constituents of steeped potatoes after 2 months storage was found to be 24.2 to 22.8% for dry matter, 2.89 to 2.66% for ash, 12.9 to 11.6% for starch, 113.2 to 60.0 mg% for total phenols as tannic acid and 0.3 to 0.1% for reducing sugars. The quantity of phenolics leached out during one month period was 34 mg/100 ml of steeping solution. KAR

- 2401 KUBOTA (K) and HOSAKA (H). Study on the cooking-rate equation including the thermal property of spherical potato. *J. Jpn. Soc. Food Sci. Technol.* 28(4); 1981; 181-5 (Japanese)

In previous papers, we have studied the cooking-rate equations of root vegetable slices¹⁾³⁾, and thermal diffusivity of spherical ones²⁾. In this paper, we studied the cooking rate equation including the thermal property of a spherical potato. The values of thermal diffusivity and Arrhenius parameters were calculated by using a non-linear least squares method. The cooking-rate equations were obtained as follows:

$$\begin{aligned} dx/d\theta &= k_{\alpha, \beta}(1-x) (x+0.1) \\ k_{\alpha, \beta} &= 1.26 \times 10^{17} \exp (-2.94 \times 10^4/R_g (t+273.2)) \\ \partial t/\partial \theta &= 0.111 (\partial^2 t/\partial r^2 + (2/r)\partial t/\partial r) \end{aligned}$$

where, $x(-)$: cooking ratio, $\theta(\text{min})$: cooking time, $t(^{\circ}\text{C})$: cooking temperature, $r(\text{cm})$: radius, $R_g = 1.987 \text{ cal/g-mol} \cdot ^{\circ}\text{K}$: gas-constant. The value of thermal diffusivity obtained was higher than $0.097 \text{ cm}^2/\text{min}$ obtained in the previous paper³⁾.

SWEETPOTATO

- 2402 MATSUOKA (H), KOBAYASHI (Y) and UEDA (S). Alcoholic fermentation of sweet-potato without cooking. *J. Ferment. Technol.* 60(6); 1982; 599-602

Alcoholic fermentation of raw sweetpotato was carried out in a one-step process which combined the conventional processes of liquefaction, saccharification and fermentation to alcohol. The enzyme used for saccharification was glucoamylase of *Rhizopus* sp., which had stronger raw starch digestion activity than that of *Aspergillus niger*. When potassium pyrosulphite was added to the fermentation broth at 0.02% or higher concentration, contamination of the broth was prevented and the yield of ethanol reached 94%. AA

- 2403 BABA (T), KOUNO (T) and YAMAMURA (E). Factors concerning with hardness and discolouration of sweetpotato chips. Development of snack foods produced from sweetpotatoes. Part I. *J. Jpn. Soc. Food Sci. Technol.* 28(6); 1981; 318-24 (Japanese)

This study was conducted in order to investigate factors concerning with hardness and discolouration of sweetpotato chips. Hardness of sweetpotato chips was apparently influenced by oil content and blister formation that occurred in tissue of chips during deep-fat frying. Enhanced blister formation in the chips resulted in an increase in oil content. These chips were found to exhibit softness and increased crispness. The void space was scarcely observed in untreated sweetpotato chips. This physical characteristic was presumed to be the predominant cause of hardening of sweetpotato chips. The lessened blistering in untreated sweetpotato chips may be due to the rapid escape of expanding water vapour from the sliced tissues during deep-fat frying. Maltose content in raw material was found to be extremely low (less than 0.1% wet basis). However, its increment during deep-fat frying was apparently noticeable. The increase in maltose during deep-fat frying was considered to be one of the factors responsible for the discolouration of chips. AA

CASSAVA

- 2404 ARGUEDAS (P) and COOKE (RD). Residual cyanide concentrations during the extraction of cassava starch. *J. Food Technol.* 17(2); 1982; 251-62

Cassava starch is traditionally extracted on a small scale in many tropical countries. The process consists of wet-milling the washed roots, washing the starch from this milled pulp on vibrating trays or in mixing tanks, sedimenting the starch in wooden canals or concrete tanks and sun-drying the product. This process was analysed during six production runs in two factories. The distribution of cyanide followed a similar pattern in both factories. Most of the cyanogenic glucosides (bound cyanide) in the roots are converted to free cyanide during the milling operation. Between 40 and 70% of the total cyanide appears in the water used to wash the starch from the disintegrated tissue, and between 5 and 10% appears in the fibrous residue used in animal feed. This residue also contains between 12 and 23% of the starch present in the cassava. The eluted starch is allowed to sediment for 1-3 days, after which it contains less than 4% of the cyanide present in the raw material. The dried product contains less than 1% of the quantity of cyanide present in the raw material; the residual concentration is 1-5 ppm. The factors involved in the removal of the cyanide during starch extraction are discussed, and their importance to more efficient large-scale processes is indicated. AA

- 2405 IKEDIOBI (CO) and ONYIKE (E). The use of linamarase in gari production. *Process. Biochem.* 17(4); 1982; 2-5

SPINACH

- 2406 TROTTER (WJ) and PARDUE (J). The results and evaluation of a limited survey for ethylenebisdithiocarbamate and ethylenethiourea residues in correlated raw and canned spinach and tomato samples. *J. Food Safety.* 4(1); 1982; 59-68

Results and evaluation for a limited survey performed in 1978, are presented for residues of ethylenebisdithiocarbamate

(EBDC) fungicides and ethylenethiourea (ETU) in raw and canned spinach and tomato samples (12 samples each of the raw and 12 each of the canned commodities). Correlated samples of each commodity were obtained by batch sampling the canned commodity and the corresponding raw commodity. Most of the tomato sample analyses were negative for EBDC and ETU. However, the 12 raw, unwashed spinach samples contained relatively high levels of EBDC residues (5.2 - 80 ppm calculated as zineb) and 0.12-2.3 ppm ETU; the ETU residue levels were somewhat proportional to the EBDC residue levels. It appears that washing the spinach before canning removes the EBDC residues, but not the ETU residues. Cooking the raw spinach samples in the laboratory to yield "cooked" or "total" ETU was found to be useful for identification and semiquantitative confirmation of EBDC residues. There was considerable variation between replicate ETU determinations for each spinach sample. AA

TOMATO

- 2407 MORESI (M) and LIVEROTTI (C). Economic study of tomato paste production. *J. Food Technol.* 17(2); 1982; 177-92

Statistics of tomato production and utilization have been reported to show the recent development of the tomato industry in the EEC countries. In particular, the profitability of tomato paste production has been evaluated and then analysed to assess the influence of the operating costs, EEC payments and market price of tomato paste. The economic balance for a plant capacity of 14 tons of raw tomatoes per hour and 2880 operational hour per year shows profitability of 22% in 1979 and 16% in 1980 owing to inflation and decrease in product demand. The annual cost of raw materials is not only more than 75% of production costs, but is also double the total capital invested. For this reason the tomato industry is compelled to resort to high-interest, short-term loans which further reduce net earnings. Mechanization of crop harvesting, automation of sorting, optimization of evaporation and packaging units and flexibility of plants are needed to maintain interest in tomato paste production in industrialized areas. AA

MELON

- 2408 ODUNFA (SA). Biochemical changes during melon fermentation for *ogiri* production. *J. Plant. Food* 4(2); 1982; 111-6

The changes in the principal constituents of melon during *ogiri* fermentation were investigated. The total nitrogen decreased in the fermented *ogiri*. The activities of proteinases increased during the fermentation as did the quantities of amino acids. The amylase activities also increased with fermentation but the soluble sugars showed a remarkable fluctuation culminating in a peak at 120 hours of fermentation. Lipase activity was minimal in the fermenting mash. The results of the enzymatic activities in *ogiri* are compared with the fermentation of similar vegetable proteins. AA

BUFFALO GOURD

- 2409 VASCONCELLOS (JA) and BERRY (JW). Characteristics of laboratory-processed *Cucurbita foetidissima* seed oil. *J. Am. Oil Chem. Soc.* 59(2); 1982; 79-84

The effects of variations in laboratory processing on the quality of the seed oil of the buffalo gourd, *Curcubita foetidissima*, were determined. Conditions found most effective were: triple refining at 65 C for 15 minutes using 16 Be and 20 Be NaOH at 80% of maximum and 20 Be NaOH at the maximum; bleaching at 105 C for 30 minutes by a mixture of activated bleaching earth (3%) and activated carbon (0.3%); and deodorization with 5% steam at 210 C for 120 minutes. Processed oil showed these analytical values: carotenoids (3.6 mg/kg), free fatty acids (0.28%), peroxide (0.2 meq/kg), conjugated unsaturated fatty acids (1.59%). Oxidative stability test (AOM) conditions gave peroxide values of 100 in 4.9 hours and 141 in 8 hours. The triglyceride fatty acid composition was 11.9% palmitic, 3.5% stearic, 22.0% oleic and 61.0% linoleic acid. AA

FRUITS

- 2410 KITSON (JA) and MacGREGOR (DR). Drying fruit purees on an improved pilot plant drum-drier. *J. Food Technol.* 17(2); 1982; 285-8

The commercially built pilot size double drum-drier has been modified to incorporate variable speed take-off rolls, cool-air flow directed at the doctor blade area and ventilation system to remove saturated air from beneath the drums. Low-moisture flakes from a wide variety of relatively high fibre fruits such as banana, apple, apricot, guava, papaya and cranberry may be dried successfully without additives provided the fruits are not overripe. Addition of 400 ppm SO₂ to apple puree before drying retarded off flavour development in puree stored for 2 years when stored at 20 C in polyethylene bags. By storing purees in gas tight containers in nitrogen or carbon dioxide atmosphere, the oxidative off flavours in dry purees may be prevented. BSN

- 2411 MAINI (SB), BRIJESH DIWAN, GUPTA (SK) and ANAND (JC). A solar drier for fruits and vegetables. *Indian Hortic.* 27(1); 1982; 21-3

The solar drier developed consists of a glossless black polythene which is stitched to sheet of bubble polythene. To this, an ultra violet light stabilised polypropylene is stitched to one longitudinal side and on the other side the polypropylene and black polythene are closed with a friction zip through which the material to be dried can be introduced or removed. The black polythene acts as the solar absorber and the polypropylene serves as the unidirectional window to let the solar energy inside, but prevent its outward loss. The bubble polythene is the insulator keeping up the efficiency of the drier by checking heat dissipation. The capacity of the drier could be increased by adding to the length of the tube. MVG

- 2412 RUCKEMANN (H). Methods for the determination of L. ascorbic acid by means of high performance liquid chromatography (HPLC). I. Determination of L-ascorbic acid in fruits and vegetables. 2. *Lebensmittel Unters. Forsch.* 171(5); 1980; 357-9 (German)

A method is described for the rapid determination of L-ascorbic acid in fruits and vegetables. L-ascorbic acid is extracted out of the sample with metaphosphoric acid and determined spectrophotometrically by HPLC without further cleanup. AA

- 2413 BAJRACHARYA (D). Nutritive values of Nepalese edible wild fruits. 2. *Lebensmittel Unters. Forsch.* 171(5); 1980; 363-6

The nutritive values of forty edible wild fruits of Nepal were determined in terms of total dry matter, sugar, protein, total ash, and sodium, potassium, magnesium and calcium. It was concluded that most of the wild fruits are comparable to cultivated fruits in nutritive values, and, therefore, may be considered as suitable for cultivation. AA

DATE

- 2414 LEESCH (JG), REDLINGER (LM), GILLENWATTER (HB) and ZEHNER (JM). Fumigation of dates with phosphine. *J. Econ. Entomol.* 75(4); 1982; 685-7

Dates in wooden crates were fumigated with phosphine under a 6-mil polyethylene tarpaulin. All the insects except some eggs of *Ephestia cautella* were killed. Gas concentration increased to 649 ppm during the first 40 hour of the fumigation, then decreased to Ca 50 ppm after 120 hour. Residue of phosphine on dates after fumigation ranged from <0.0007 to 0.0013 ppm. The phosphine fumigation of dates under a polyethylene tarpaulin appears practical. KAR

MANGO

- 2415 CHIKKASUBBANNA (V) and HUDDAR (AG). Ripening of Alphonso mangoes (*Mangifera indica* L.) for processing. *Indian Food Packer.* 36(3); 1982; 38-42

Different methods of commercial ripening like treating with ethylene (250-1000 ppm) and ripening by conventional methods of Alphonso mangoes were studied to obtain the better quality fruits and reduce the spoilage by reducing ripening time and bringing the uniformity in the fruits. Among these, ethrel at 750 ppm was found to be optimum for obtaining the fruits with desirable colour, flavour and other attributes. AA

- 2416 KATWA (LC), RAMAKRISHNA (M) and RAGHAVENDRA RAO (MR). Purification and properties of polyphenol oxidase from mango peel (*Mangifera indica* Var. *Raspuri*). *J. Food Biochem.* 6(4); 1982; 217-28

Polyphenol oxidase from the peel of ripe mango fruit (*Mangifera indica* Var. *Raspuri*) was purified 126-fold to homogeneity by ammonium sulphate fractionation, column chromatography on Blue Sepharose CL-6B and gel chromatography on Sephadex G-200. It had an iso-electric point (pI) of 4.1 ± 0.2 and molecular weight of 137,000 daltons as determined by sodium dodecyl sulphate-polyacrylamide gel electrophoresis and gel filtration. It was more specific for catechol (than for other substrates tested) with a K_m of 8.2 mM. 2-mercaptoethanol, L-cysteine, sodium diethyldithiocarbamate and thiourea were effective inhibitors of this enzyme. It had pH and temperature optima of 5.5 and 46 C, respectively. It lost 50% activity by exposure to 85, 75 and 65 C for 3, 16 and 25.5 minutes, respectively. Copper content was one atom per mole of enzyme and copper was essential for its activity. Unlike most of the polyphenol oxidases, multiple forms were not detected in the crude extract. AA

APPLE

- 2417 KILARA (A). Enzymes and their uses in the processed apple industry: A review. *Process Biochem.* 17(4); 1982; 35-41

Discusses: enzymes affecting quality of raw materials; use in fruits and fruit products; nature of substrates; nature of the enzyme; manufacture of pectolytic enzymes; application of pectinases; recommended use level of enzymes; use of enzymes in juice extraction; economic position of pectinases; and future research needs. BSN

- 2418 HISLOP (EC), PAVER (JL) and KEON (JPR). An acid protease produced by *Monilia fructigena* *in vitro* and in infected apple fruits, and its possible role in pathogenesis. *J. Gen. Microbiol.* 128(4); 1982; 799-807
- 2419 MAINI (SB), BRIJESH DIWAN, LAL (BB) and Anand (JC). Packaging, transport and storage of apples in wooden containers. *Indian Food Packer.* 36(3); 1982; 34-7

Apples (18 kg) were packed in different types of containers (30 x 30 x 45 cm) ((i) Simla packing with tray; (ii) Simla packing without paper; (iii) Simla packing (paper wrap); (iv) chir box (with paper wrap); (v) Toon veneer (with paper wrap); (vi) Fir veneer (with paper wrap); (vii) Thin plywood (with paper wrap); and (viii) Poplar box (with paper wrap)) for studying transport and storage behaviour of fruits. Bruising damage was minimum (8%) in (i) and maximum of 23.3% in (viii). A physiological loss in weight of 725 g in fruit (18 kg) was observed in (ii) after 5 month storage at 34-37 F and RH 80-90%. Since shrivelling percentage is high (16%) in (i), need for polythene covering has been indicated. Decline in TSS could be used as an index for deterioration of apple quality. BSN

PEAR

- 2420 SOHAN SINGH and DHILLON (BS). Changes in total phenolics during development and maturity of sub-tropical pears. *J. Food Sci. Technol. (India)* 19(6); 1982; 263-4

Total phenolics were estimated in sub-tropical pear cv. Patharnakh (*Pyrus pyrifolia*) and cv. LeConte (*Pyrus communis* x *P. pyrifolia*) from 10th day after full bloom to 150th day at 10-day intervals in the year 1979 and 1980. Phenolic content was very high during the first 20 days after full bloom; which fell down after 30 days and maintained at that level with minor fluctuations till harvest. The total phenolics were high in cv. Patharnakh than cv LeConte during development and maturity. KAR

CASHEW

- 2421 AUGUSTIN (A). Studies on the clarification of cashew apple juice for the preparation of cashew syrup. *Indian J. Nutr. Dietet.* 19(6); 1982; 169-72

Cashew apple juice extracted by hand pressing of fruits (yield, about 35%) was clarified by using (i) gelatin (0.3-0.4%), (ii) calcium hydroxide (0.4-0.5%), (iii) calcium hydroxide + gelatin (0.1-0.4%), (iv) pectin (0.3-0.35%) and (v) polyvinyl pyrrolidone (PVP). Based on the data obtained for brix, acidity, tannin content, taste and flavour, syrup prepared from (v) after dilution with water three times its volume was found to give the best product. The bottled syrup retained its golden yellow colour during a storage period of one year. The cost of the product has been worked out at Rs. 8.43/bottle (750 ml). BSN

PEACH

- 2422 DHILLON (BS), SAINI (HS) and SOHAN SINGH. Application of GA on the (cold) storage life of peach. *Indian Food Packer*. 36(3); 1982; 31-3

Flordasun and Sharbati peaches were sprayed with GA₃ at 200-1000 ppm levels at full blood stage. Of these levels, 800 and 1000 ppm, GA₃ could effectively check weight loss and extended the cold storage life of Flordasun and Sharbati peaches upto 10 and 24 days, respectively. Different GA₃ concentration did not show much effect on TSS, titratable acidity and sugars, except in Sharbati where the total sugars considerably increased due to GA₃ application. AA

MANGOSTEEN

- 2423 SAMPATHU (SR) and KRISHNAMURTHY (N). Processing and utilization of Kokam (*Garcinia indica*). *Indian Cocoa Arec. Spices. J.* 6(1); 1982; 12-3

Aspects covered in this brief review include chemical composition of Kokam rind and characteristics of the Kokam fat; process for the preparation of Kokam fat and the uses of Kokam fat. BSN

PAPAYA

- 2424 SELVARAJ (Y) and PAL (DK). Changes in the chemical composition of papaya (Thailand variety) during growth and development. *J. Food Sci. Technol.* (India). 19(6); 1982; 257-9

Thailand variety papaya fruits were harvested from 15th day of anthesis at 15 to 10 day intervals until maturity (160 days) and analysed for sugars, acidity, vitamins, minerals and respiration. The fruit pulp was mostly composed of water (87.6-93.8%) and carbohydrates (1.2-8.4%) at different developmental stages. Sucrose, glucose and fructose formed 10.8-41.6, 19.9-66.5 and 17.5-37.5% respectively of total sugars during fruit ontogeny. DM increased in pre-ripe and ripe stages along with increase in vitamin C, vitamin A, Ca, P, K contents. Fe content showed little change during fruit development. Respiration pattern followed a typical climacteric rise. KAR

SUGAR, STARCH AND CONFECTIONERY

- 2425 LIYANAGE (AW), HETTARCHCHI (MR) and JAYATISSA (PM). Contaminant yeasts of sugar cane products of Sri Lanka. *J. Food Sci. Technol.* (India) 19(6); 1982; 270-72

Twenty two strains of yeasts isolated from samples of molasses, jaggery and sugar cane syrups were characterized and identified using biochemical and morphological characteristics. The yeasts belonged to six genera comprising *Sporobolomyces* (2 strains), *Candida* (3 strains), *Torulopsis* (1 strain), *Saccharomyces* (3 strains), *Brettanomyces* (1 strain), *Kluyveromyces* (1 strain) and *Hansenula* (1 strain). The predominant sp., was *Saccharomyces cerevisiae* (10 strains). KAR

BAKERY PRODUCTS

BREAD

- 2426 SELVARAJ (A) and SHURPALEKAR (SR). On improving the quality of soya - fortified bread. *J. Food Sci. Technol. (India)*. 19(6); 1982; 242-245
- Bread was prepared by adding soy flour at 8, 10, 12, 14 and 16% level to maida (refined wheat flour) and evaluated for farinograph water absorption, mixing tolerance index, loaf volume and for acceptance. Upto 10% addition bread of satisfactory quality was obtained; though at 12% level a fair quality bread was obtained it was further tried with dry yeast (0.5-2.5%), sugar (2.5-10.0%), fat (2.0%-6.0%) and additives like GMS, lecithin and SSL at 0.5 and 1.0% level each. Fermentation and proofing times were also altered from 85-165 minutes and 40-75 minutes respectively. It was found that a highly acceptable bread with 12% soy flour addition could be obtained by including (i) 5% each of sugar and fat in case of small/cottage scale bakeries and (ii) 5% sugar, 2% fat and 0.5% each of lecithin and GMS in commercial bakeries. When yeast was added at 0.5 and 2.0% level the fermentation and proofing time required were 165-105 minutes and 75-45 minutes respectively, for 100 g loaf of bread. KAR

PASTA

- 2427 RIBOH (DL) and LABUZA (TP). Effect of sine wave temperature cycling on thiamin loss in fortified pasta. *J. Food Process. Preserv.* 6(4); 1982; 253-64
- The loss of thiamin in fortified pasta was studied under steady state conditions of 30, 37 and 45 C. Using this data and the Arrhenius relationship, the reaction kinetics for each temperature were determined and then used to predict the loss of thiamin in pasta stored under a sine wave fluctuating temperature condition (25/45 C). The predicted values were compared to actual losses found in pasta stored in the sine wave condition. Three statistical methods were utilized to specify the confidence in the predicted values. The Hicks-Schwimmer-Labuza model was found to be adequate for the prediction of the amount of loss from steady state data (20-25% error). AA

MILK AND DAIRY PRODUCTS

MILK

- 2428 RUCKEMANN (H). Methods for the determination of L-ascorbic acid by means of high performance liquid chromatography (HPLC). II. Determination of L-ascorbic acid in milk replacing feed formulaes. *Z. Lebensmittel-Unters. Forsch.* 171(6); 1980; 446-8 (German)
- A method is described for the rapid determination of L-ascorbic acid in milk replacing feed formulae. L-ascorbic acid is extracted from the sample with metaphosphoric acid and determined by HPLC with electrochemical detection. AA

- 2429 REEVE (LE), JORGENSEN (NA) and DeLUCA (HF). Vitamin D compounds in cows milk. *J. Nutr.* 112(4); 1982; 667-72

The milk from cows fed normal levels of vitamin D has been found to contain approximately 4010 per litre of vitamin D activity. A 14-fold increase in dietary vitamin D intake causes only a doubling of the amount of vitamin D in milk. The compounds that are responsible for this activity have been isolated and quantitated to determine the fraction of the total activity supplied by each compound. KAR

- 2430 JAYNES (HO) and WHITNEY (RMCL). Resin-contact-time method for determination of protein-bound calcium in milk and model systems. *J. Dairy Sci.* 65(7); 1982; 1074-83

- 2431 SCHMIDT (RH) and PADUA (MR). Effects of heat treatment and K-Carrageenan addition on protein solubility and viscosity of milk protein/peanut flour blends in an ionic environment simulating cow's milk. *J. Food Process. Preserv.* 6(4); 1982; 243-52

- 2432 El-SISSI (MGM), KORTSTEE (GJJ) and MULDER (EG). Decomposition of casein by *Caseobacter polymorphus* strain 253. *J. Dairy Sci.* 65(7); 1982; 1084-94

- 2433 HAYAKAWA (M) and DeMAN (JM). Consistency of fractionated milk fat as measured by two penetration methods. *J. Dairy Sci.* 65(7); 1982; 1095-1101

- 2434 DeMAN (JM) and FINORO (M). Characteristics of milk fat fractionated by crystallisation from the melt. *Can. Inst. Food Sci. Technol. J.* 13(4); 1980; 167-73

- 2435 HEKMATI (M), BRADLEY (RL) Jr. and SUNDE (ML). Screening test for toxicity of chlorinated milk derivatives by a fertile egg injection technique. *J. Dairy Sci.* 65(7); 1982; 1318-20

- 2436 BYNUM (DG) and OLSON (NF). Standardization of a device to measure firmness of curd during clotting of milk. *J. Dairy Sci.* 65(7); 1982; 132-4

- 2437 TROLLER (JA) and STINSON (JV). Moisture requirements for growth and metabolite production by lactic acid bacteria. *Appl. Environ. Microbiol.* 42(4); 1981; 682-7

- 2438 HEGAZI (FZ) and ABO-ELNAGA (IG). Production of acetoin and diacetyl by lactic acid bacteria in skimmed milk with added citrate and pyruvate. *Z. Lebensmittel Unters. Forsch.* 171(5); 1980; 367-70

Thirty two strains of starter cultures and lactic acid bacteria belonging to the genera *Streptococcus*, *Leuconostoc* and *Lactobacillus* were studied for their ability to produce acetoin (A) and diacetyl (D) in skimmed milk with added citrate and pyruvate. It was shown that depending on the composition of culture medium and strains of bacteria, different quantities of the mentioned aroma substances were formed. The largest amount of diacetyl was produced by 70% of the streptococci from citrate added to skim milk. KMD

- 2439 KUBOTA (K), KURISU (S), SUZUKI (K), MATSUMOTO (T) and HOSAKA (H). Study on the flow equations of sugar, salt and sugar-salt-skim milk solutions. *J. Jpn. Soc. Food Sci. Technol.* 28(4); 1981; 186-193 (Japanese)

The flow equation of sugar, salt and sugar-salt-skim milk solutions was expressed as follows:

$$\dot{\gamma} = (1/K) g_s \tau, \quad K = A \exp (B/(t+273.2))$$

where, $\dot{\gamma}$ (sec⁻¹); shear rate, τ (g_f/cm²); shear stress, g_s (g · cm/g_f · sec²); gravitational conversion factor, K (g/cm · sec); viscosity, and t (°C); temperature. The values of A and B were expressed as a function of concentration S (wt%).

For sugar solution ($S=0\sim 30$ wt%, $t=10\sim 50^\circ\text{C}$);

$$A = 10^{(-1.17 \times 10^{-2} S^{0.88} - 4.00)}, \quad B = 10.7 S^{1.16} + 2.02 \times 10^3$$

For salt solution ($S=0\sim 24$ wt%, $t=10\sim 50^\circ\text{C}$);

$$A = 10^{(0.00 \times 10^{-2} S^{1.30} - 4.00)}, \quad B = 1.95 \times 10^3$$

The value of K for sugar-salt-skim milk solution ($S=0\sim 15$ wt%, $t=10\sim 50^\circ\text{C}$) was expressed as follows;

$$K = (k_s x_s + k_N x_N + k_M x_M) (1 - 4.2 \times 10^{-2} x_s x_N - 3.4 \times 10^{-2} x_s x_M - 8.4 \times 10^{-2} x_N x_M + 1.67 \times 10^{-2} x_s x_N x_M + 3.8 \times 10^{-2} x_s x_N + 2.7 \times 10^{-2} x_s x_M + 7.1 \times 10^{-2} x_N x_M - 1.26 \times 10^{-2} x_s x_N x_M)$$

where, k_s, k_N, k_M (g/cm · sec); K 's values of sugar, salt and skim milk solutions for concentration of S , and x_s, x_N, x_M (-); mass fractions of sugar, salt and skim milk.

- 2440 KLAENHAMMER (TR). Microbiological considerations in selection and preparation of *Lactobacillus* strains for use as dietary adjuncts. *J. Dairy Sci.* 65(7); 1982; 1339-49

- 2441 NODA (K), KENJO (N) and TAKAHASHI (T). Determination of a small amounts of saccharin in milk beverages and fermented milk beverages by gas chromatography. *J. Jpn. Soc. Food Sci. Technol.* 28(6); 1981; 328-31

A small amount of saccharin in milk beverages and fermented milk beverages was determined by gas chromatography. The results obtained were as follows: Saccharin was extracted by dialysis using cellulose tube and then methylated by diazomethane. The detector of the gas chromatograph should be changed by the amount of saccharin which was analysed. FPD and ECD were suitable for the detection of μg of saccharin, and FID was suitable for mg of saccharin. The recovery rate was 80-100% in each case. It was revealed that this method was applicable to milk beverages and fermented milk beverages containing interfering substances. AA

YOGURT

- 2442 SURIYARACHCHI (VR) and FLEET (GH). Occurrence and growth of yeasts in yogurts. *Appl. Environ. Microbiol.* 42(4); 1981; 574-9

CHEESE

- 2443 FRANK (JF) and BIRTH (GS). Application of near infrared reflectance spectroscopy to cheese analysis. *J. Dairy Sci.* 65(7); 1982; 1110-16

- 2444 PECHANÉK (U), BLAICHER (G), PFANNHAUSER (W) and WOJDICH (H). Determination of biogenic amines in cheese and fish. *Z. Lebensmittel Unters. Forsch.* 171(6); 1980; 420-4 (German)

After extraction with 5% trichloroacetic acid, the amines were separated by ion exchange using an amino acid analyses. The amine composition of several cheese varieties, frozen and fresh fish was determined as well as changes during storage. AA

- 2445 BUCHANAN (RL). Inherent safety of cheese and meat fermentations: A review of some toxicological considerations. *J. Food Safety.* 4(2); 1982; 125-37
Discusses: microorganism produces toxic metabolite and conversion of food constituents to toxin. BSN

- 2446 KALAB (M), LOWRIE (RJ) and NICHOLS (D). Detection of curd granule and milled curd junctions in cheddar cheese. *J. Dairy Sci.* 65(7); 1982; 1117-21

- 2447 WOO (AH) and LINDSAY (KC). Rapid method for quantitative analysis of individual free fatty acids in cheddar cheese. *J. Dairy Sci.* 65(7); 1982; 1102-9

A reliable method for routine quantification of carbon-4 to carbon 18:3 free fatty acids in cheddar cheese was developed. The free fatty acids were isolated on a modified silicic acid-potassium hydroxide arrestant column following removal of lactic acid with a partition pre-column. Rapid separation and quantification of free fatty acids in formic acid mobilized eluates was achieved by gas chromatographing on 5% diethylene glycol succinate (DEGS-PS) in packed, glass columns. Quantitative free fatty acid profiles of nonrancid and rancid cheddar cheese samples were obtained. AA

- 2448 LOWRIE (RJ), KALAB (M) and NICHOLS (D). Curd granule and milled curd junction patterns in cheddar cheese made by traditional and mechanized processes. *J. Dairy Sci.* 65(7); 1982; 1122-9

- 2449 KERR (TJ), WASHAM (CJ), EVANS (AL) and TODD (RL). Effects of fat content on the microstructure of domiati-type cheese. *J. Food Prot.* 44(7); 1981; 496-9

- 2450 CHIBA (Y) and SATO (Y). Bitter peptides from Gouda-type cheese. *J. Jpn. Soc. Food Sci. Technol.* 28(6); 1981; 325-7 (Japanese)

A study was carried out on the amino acids constituting bitter peptides isolated and purified from Gouda-type cheese. Results are as follows: Gouda-type cheese contains more than four kinds of bitter peptides with the molecular weight of 500 to 2000. It is supposed that one of the four kinds of bitter peptides may be produced from either α - or κ -casein, and the others are produced from β -casein. AA

MEAT AND POULTRY

- 2451 SUSHIL KUMAR. Recent trends in use of nitrites in curd meats - a review. *Indian Food Packer.* 36(3); 1982; 84-91

Aspects covered include, role of nitrite in curd meat; effect on colour and flavour of meat, nitrite and botulism safety; health hazards of nitrite; substitutes for nitrite, and methods of inhibiting nitrosamine formation. BSN

- 2452 KRZYWICKI (K). The determination of haem pigments in meat. *Meat Sci.* 7(1); 1982; 29-36
 The determination of haem pigment concentration in meat is described. The absorbancies of the extract are measured at 572, 565, 545 and 525 nm and the total concentrations, as well as the relative concentrations, of oxidised, oxygenated or reduced pigment forms are calculated. The procedure is simple and gives information in a single step which otherwise would be available only by using two separate methods. AA
- 2453 BELLATTI (M) and PAROLARI (G). Aliphatic secondary amines in meat and fish products and their analysis by high pressure liquid chromatography. *Meat Sci.* 7(1); 1982; 59-65
- 2454 KAISER (KP), MATHEIS (G), DURRMANN (CK) and BELITZ (HO). Protein differentiation with electrophoretic methods in meat, fish and derived products. II. Qualitative and quantitative analysis of raw binary meat mixtures by means of isoelectric focusing in polyacrylamide gel. *Z. Lebensmittel-Unters. Forsch* 171(6); 1980; 415-9 (German)
 The identification of animal species in raw binary meat mixtures is possible by means of isoelectric focusing of the aqueous extracts. Densitometric evaluation of the protein pherograms makes possible the quantitative analysis of such mixtures down to a minimum level of 2-5% of one of the components. The method has some advantages as compared to immunochemical methods. AA
- 2455 RESTAINO (L) and HILL (WM). Microbiology of meats in a hypobaric environment. *J. Food Prot.* 44(7); 1981; 535-8
- 2456 KOTULA (AW). Microbiology of hot-boned and electrostimulated meat. *J. Food Prot.* 44(7); 1981; 545-9
- 2457 MAXCY (RB). Surface microenvironment and penetration of bacteria into meat. *J. Food Prot.* 44(7); 1981; 550-52
- 2458 VASSILIADIS (P), KALAPOTHAKI (V), TRICHOPOULOS (D), MAVROMMATTI (C) and SERIE (C). Improved isolation of salmonellae from naturally contaminated meat products by using Rappaport-Vassiliadis enrichment broth. *Appl. Environ. Microbiol.* 42(4); 1981; 615-8
 A total of 454 specimens of meat products were examined for salmonellae by using five procedures of enrichment. The use of a selective motility medium, inoculated from enrichment in Muller-Kauffmann broth, resulted in an increase in the number of positive specimens. However, simple enrichment in Rappaport-Vassiliadis broth, after preenrichment, was more sensitive and specific for recovering salmonellae than the selective motility medium-Muller-Kauffmann broth method. AA
- 2459 TAN (KH) and GILL (CO). Physiological basis of CO₂ inhibition of a meat spoilage bacterium, *Pseudomonas fluorescens*. *Meat Sci.* 7(1); 1982; 9-17
- 2460 METAXOPOULOS (J), GENIGEORGIS (C), FANELLI (MJ), FRANTI (C) and COSMA (E). Production of Italian dry salami: Effect of starter culture and chemical acidulation of staphylococcal growth in salami under commercial manufacturing conditions. *Appl. Environ. Microbiol.* 42(5); 1981; 863-71

- 2461 MASTERS (BA), OBLINGER (JL), GOODFELLOW (SJ), BACUS (JN) and BROWN (WL). Fate of *Salmonella newport* and *Salmonella typhimurium* inoculated into summer sausage. *J. Food Prot.* 44(7); 1981; 527-30

BEEF

- 2462 ADAMS (NJ), SMITH (GC) and CARPENTER (ZL). Performance, carcass and palatability characteristics of longhorn and other types of cattle. *Meat Sci.* 7(1); 1982; 67-79

- 2463 FUNG (DYC), KASTNER (CL), CHIA-YEN LEE, HUNT (MC), DIKEMAN (ME) and KROPF (DH). Initial chilling rate effects on bacterial growth on hot-boned beef. *J. Food Prot.* 44(7); 1981; 539-44

Hot-boned beef cuts are in good bacteriological condition (no potential health hazards) for storage, if chilled to 21 C in 3 to 9 hours. KMD

- 2464 KAMEL (BS). Effect of protein extenders on fatty acids, cholesterol, sensory quality and cooking loss of beef patties. *J. Food Quality.* 5(1); 1981; 17-31

Present investigation reports the best way to utilize carcass fat and the best level of fat in beef patties with the highest consumer acceptability and also shows the possibility of extending such products with protein concentrate to balance the protein and fat level. KAR

- 2465 SHARMA (N), PADDA (GS) and KONDAIAH (N). Preparation of buff sausage. *Indian Food Packer.* 36(3); 1982; 50-52

Sausage from buffalo meat was prepared using 85% meat, 15% vegetable oil or buffalo fat, 3% filler, 2.5% common salt, 2% seasonings and 6.25% water. The product developed dark brown colour and lost eye appeal on cooking. Strawberry colour and sodium nitrite at 100 and 200 ppm were added for stabilisation of colour. The preparation containing 100 ppm sodium nitrite contained buffalo fat in place of vegetable oil. The sausage containing 200 ppm sodium nitrite was best in colour and overall acceptability. Addition of buffalo fat reduced cooking loss and increased juiciness of the product. The sausage containing strawberry colour or 100 ppm sodium nitrite was also acceptable to the taste panel. AA

SHEEP

- 2466 LAMBOOY (E). Some aspects of the effectiveness of stunning in sheep by the captive bolt. *Meat Sci.* 7(1); 1982; 51-7

- 2467 BLACKMORE (DK) and NEWHOOK (JC). Electroencephalographic studies of stunning and slaughter of sheep and calves. Part 3. The duration of insensibility induced by electrical stunning in sheep and calves. *Meat Sci.* 7(1); 1982; 19-28

- 2468 PETERSEN (GV). A plug sampling technique for measuring the pH of carcass muscles. *Meat Sci.* 7(1); 1982; 37-42

PORK

- 2469 SHARMA (N), PADDA (GS) and LAKSHMANAN (V). Quick curing of ham slices. *Indian Food Packer*. 36(3); 1982; 74-6
The quick curing method involves curing of sliced ham by dry and wet brine method within 2-3 days with full development of cured, colour and flavour. At 5 C, the product stored satisfactorily for six weeks. BSN
- 2470 JEREMIAH (LE). The effects of frozen storage and thawing on the retail acceptability of ham steaks and bacon slices. *J. Food Quality*. 5(1); 1981; 43-58
- 2471 JOHNSON (DD), SAVELL (JW), WEATHERSPOON (L) and SMITH (GC). Quality, palatability and weight loss of pork as affected by electrical stimulation. *Meat Sci*. 7(1); 1982; 43-50
- 2472 JEREMIAH (LE). The effects of frozen storage on the retail acceptability of pork loin chops and shoulder roasts. *J. Food Quality*. 5(1); 1981; 73-88
- 2473 SHINMURA (Y), YAMADA (J), FUJII (S), KASUGAYA (K) and KOHASAKA (K). The effect of the addition of polyphosphate on quality of cooked cured pork loins on the pickle injection method. *J. Jpn. Soc. Food Sci. Technol*. 28(6); 1981; 332-7
This work was undertaken to obtain technological information on the manufacturing process of hams by a multiple pickle injector. The effect of polyphosphate added in loins injected with pickle on water holding capacity, colour forming ratio, remaining rate of NO_2^- and others was investigated. Water holding capacity of cooked cured loin with 2% NaCl increased significantly with an increase of the amount of polyphosphate injected. An addition of polyphosphate in the amount of 0.3% or more maintained a relatively high constant level of water holding capacity of loin. Cut surface of cooked cured loin having 0.5% of polyphosphate was considerably lowered in Hunter L and b-values in comparison with that having no polyphosphate. The remaining rate of NO_2^- in loin increased with an increase of the amount of polyphosphate, on the contrary, the colour forming ratio was lowered. Particularly, the injection of 0.5% or more of polyphosphate induced a marked lowering of colour forming ratio. It was found that the distribution of polyphosphate in loin injected with pickle was uneven, indicating a partially high content of polyphosphate. AA

PORCINE

- 2474 JEREMIAH (LE). Influence of anatomical location and muscle quality on porcine lipid composition. *Meat Sci*. 7(1); 1982; 1-7
- 2475 DOYLE (MP), HUGDAHL (MB) and TAYLOR (SL). Isolation of virulent *Yersinia enterocolitica* from porcine tongues. *Appl. Environ. Microbiol*. 42(4); 1981; 661-6

POULTRY

- 2476 PANDA (PC). Poultry products technology in India - Prospects and problems. *Poultry Guide*. 19(7); 1982; 21-8
The author has reviewed briefly the technology used at present in India for eggs and poultry meat, covering raw material collection, storage, processing, packaging and transport, and quality control. KMD

- 2477 KARKALAS (J), DONALD (AE) and CLEGG (KM). Cholesterol content of poultry meat and cheese determined by enzymic and gas-liquid chromatography methods. *J. Food Technol.* 17(2); 1982; 281-3

- 2478 HAMM (D) and SEARCY (GK). Mineral content of commercial samples of mechanically deboned poultry meat. *Poult. Sci.* 60(3); 1981; 686-8

Nine commercial samples of mechanically deboned poultry meat, including products from broiler, fowl, and turkey parts, were analysed for potassium, sodium, phosphorus, calcium, magnesium, iron, zinc, copper, manganese, and lead. Calcium content, which had a fourfold range over the nine samples, probably reflected the varying bone content. Iron content, for which the literature provides widely different values within a product type, fell within reasonable limits for specific products analysed. The many, almost uncontrollable production factors, and the consequent high variability in mineral composition, suggest the need for frequent monitoring of production lots of these products for mineral elements of nutritional interest. AA

EGG

- 2479 D'AOUST (JY), STOTLAND (P) and RANDALL (CJ). *Salmonella* in "grade cracks" shell eggs. *Can. Inst. Food Sci. Technol. J.* 13(4); 1980; 184-7

- 2480 RAYMOND(DP), RANDALL (CJ) and VOISEY (PW). Functionality of native and heat treated egg white and beef in a meat emulsion system. *Can. Inst. Food Sci. Technol. J.* 13(4); 1980; 174-7

SEAFOODS

- 2481 MOHNKE (H). Fish processing machines at the International Fishery exhibition INRYBPROM '80. *Lebensmittelindustrie.* 27(12); 1980; 545-8 (German)

- 2482 YU (SY), SIAW (CL) and IDRUS (AZ). The application of technology to the processing of dry-salted fish in Peninsular Malaysia; Comparison of sun-dried and oven-dried fish. *J. Food Technol.* 17(2); 1982; 211-8

Investigation of processing of dry-salted fish is described. The use of a satisfactory ratio of salt to fish, optimization of salting time and the use of mechanical driers to reduce drying time, insect infestation and microbial spoilage were investigated. Results indicated that oven-dried fish salted at 10% and 20% levels were most acceptable. The corresponding sun dried samples had an undesirable odour, flavour and texture due to their higher moisture contents. At the 30% and 40% salt levels for both processes, the differences were less pronounced, but the samples that were sun-dried were more acceptable mainly as a result of a better appearance. AA

- 2483 ZAPATA (JF) and PRICE (JF). Evaluation of texture and water holding capacity in cooked minced fish. *J. Food Process. Preserv.* 6(3); 1982; 189-95

A meat sausage type batter system consisting of mechanically deboned sucker (*Catostomidae* family) flesh and binder ingredients was evaluated for texture and water holding capacity (WHC) by various techniques. The Instron Universal testing instrument for texture and the centrifuge method for WHC were found to be the most reliable procedures to evaluate the

the cooked fish matrix. Although texture and WHC were improved by the addition of salt and soy protein isolate (SPI) or sodium caseinate (SC), the firmness characteristics of the cooked flesh matrix seemed to depend greatly on the nature of the fish and type of cooking. AA

ANCHOVY

- 2484 FILSINGER (B), BARASSI (CA), LUPIN (HM) and TRUCCO (RE). An objective index for the evaluation of the ripening of salted anchovy. *J. Food Technol.* 17(2); 1982; 193-200

COD

- 2485 POULTER (RG), DOE (PE) and OLLEY (J). Isohalic sorption isotherms. II. Use in the prediction of storage life of dried salted fish. *J. Food Technol.* 17(2); 1982; 201-10

Isohalic sorption isotherms of cod (*Gadus morrhua*) are used, in conjunction with growth data for dun mould (*Wallemia sebi*), to predict the shelf life of dried salted fish in tropical climates. Measured shelf-lives of several fish species processed and stored by traditional methods are in agreement with the predictions. AA

RED HAKE

- 2486 LUNDSTROM (RC), CORREIA (FF) and WILHELM (KA). Dimethylamine production in fresh red hake (*Urophycis chuss*): The effect of packaging material oxygen permeability and cellular damage. *J. Food Biochem.* 6(4); 1982; 229-41

HORSE MACKEREL

- 2487 TASHIRO (I), ITOH (S) and TSUYUKI (I). Seasonal variation of total lipids of horse mackerel. Studies on lipids of horse mackerel. Part I. *J. Jpn. Soc. Food Sci. Technol.* 28(6); 1981; 309-17 (Japanese)

Lipid and fatty acid compositions of the total lipids and fatty acid composition of the fractionated lipids in meat and viscera of horse mackerel, *Trachurus japonicus* in four seasons were examined by means of thin layer chromatography (TLC) and gas liquid chromatography (GLC). The total lipids were extracted with BLIGH and DYER method and fractionated by TLC. Fatty acid compositions of the total and fractionated lipids were determined by GLC. The results obtained were as follows: The total lipid content was higher in spring and summer than in autumn and winter, and it seems to be caused by the increase of triacylglycerines. On the other hand, the compound lipid content was constant through the year. C 16:0 acid content (%) in the total lipids was constant through the year. C 18:1 acid content (%) was rather high in spring and summer; on the contrary; C 22:6 acid content (%) was rather high in winter and autumn. C 22:6 acid content (%) was higher in the compound lipid fraction than in the other fractions and it seems that this phenomenon relates to the increase of C 22:6 acid content in the total lipids in winter. AA

GURNARD

- 2488 VYNCKE (W). Quality assessment of gutted and ungutted gurnard (*Trigla* spp) by organoleptic and objective methods. *Z. Lebensmittel Unters. Forsch.* 171(5); 1980; 352-4

The quality of grey (*Eutrigla gurnardus* L.) and yellow gurnard (*Trigla lucerna* L) both gutted and ungutted, stored in ice was assessed regularly by organoleptic and objective methods viz. electrical resistance, total volatile bases (TVN), trimethylamine (TMA), pH, hypoxanthine, and inosine monophosphate (IMP). Spoilage patterns were very similar for both species. Sensory tests showed that evisceration prolonged shelf life by about two days. From the objective quality assessment methods tested, only TVN, pH and to a lesser extent TMA were in good agreement with organoleptic determinations. IMP however appeared to be of value as an indicator of early chill storage changes. AA

TILAPIA

- 2489 RAMACHANDRAN NAIR (KG) and GOPAKUMAR (K). Effect of age on the fatty acid composition of Tilapia (*Tilapia mossambica*). *J. Food Sci. Technol.* (India) 19(6); 1982; 250-54

The changes occurring in the fatty acid composition of *Tilapia mossambica* during growth were studied. Fish grown in the same environmental conditions were fed an artificial diet. Fatty acid composition of the body and intestinal fat of fish at the age of 1, 6, 12 and 24 months was determined. The polyunsaturated fatty acid content was found to increase upto 6 months and to slowly decrease thereafter, and this was particularly marked in the 22:6 fatty acids of Tilapia muscle lipids. Statistical analysis showed, that provided other factors like diet and environment, etc., remain unchanged, age has little influence on the overall fatty acid composition of fish fats. AA

KRILL

- 2490 SYNOWIECKI (J), SIKORSKI (ZE) and NACZK (M). The activity of immobilized enzymes on different krill chitin preparations. *Biotechnol. Bioeng.* 23(10); 1981; 2211-5

CLAM

- 2491 GREENBERG (EP), DUBOISE (M) and PALHOF (B). The survival of marine vibrios in *Mercenaria mercenaria*, the hardshell clam. *J. Food Safety.* 4(2); 1982; 113-23

PROTEIN FOODS

Nil

FRUIT JUICES AND BEVERAGES

- 2492 STREIT (W). ENA - European numbering of articles. *Flussiges Obst*. 47(11); 1980; 560-3 (German)
- 2493 STREIT (W). The eco-profile of packages. *Flussiges Obst*. 47(11); 1980; 560 (German)
- 2494 SCH (W). Considerations on one way beverage packages. *Flussiges Obst*. 47(11); 1980; 557-9 (German)
- 2495 HINSCH (W), ANTONIJEVIC (A) and SUNDARAM (V). Automated enzymic determination of glycerol in beverages by an immobilized glycerol dehydrogenase nylon-tube reactor. *Z. Lebensmittel Unters Forsch.* 171(6); 1980; 449-50
- 2496 RADLOFF (M). Present status and trends in the manufacture of hard drinks in Finland. *Lebensmittel industrie.* 27(12); 1980; 564-8 (German)

FRUIT JUICE

- 2497 TRENKLE (K). Worldwide standardization of fruit juices and nectars. *Flussiges Obst*. 47(10); 1980; 515-7 (German)
- The fourteenth meeting of the ECE (Economic committee for Europe)/Codex-Alimentarius Expert group for the standardisation of fruit juices was held from 9th to 13th June 1980 in Geneva. Important results of this meeting have been given. A new definition of the term "Fruit juice" has been suggested. It is as follows: Fruit juice or its essential components are the soluble or floating fruit juice components, which comprise the eatable portion of the fruit. After the separation of the insoluble components, it must contain the original components of the liquid phase of the fruit, the soluble components and the aroma and taste substances". The expert group also decided not to change the existing standards. The difference between juice and nectar was mentioned. A working programme for future was presented. VR
- 2498 BAUMANN (H). The regulations on finished package in the fruit juice industry. *Flussiges Obst*. 47(11); 1980; 547-51 (German)

RASPBERRY

- 2499 COFFEY (DG), CLYDESDALE (FM), FRANCIS (FJ) and DAMON (RA). Stability and complexation of cyanidine-3-glucoside and raspberry juice extract in the presence of selected cations. *J. Food Prot.* 44(7); 1981; 516-23
- The formation of metal-anthocyanin complexes was indicated by changes in the colour of samples of raspberry juice extract treated with Sn^{++} , but not in samples of purified cyanidine-3-glucoside. The latter forms complexes with Al^{+++} at pH 2.0 and 3.0, and with Sn^{++} at pH 4.0 and 3.0. These metals form similar complexes with raspberry juice extract at the same, respective pH values. KMD

MORELLO CHERRY

- 2500 EKSI (A), REICHENEDER (E) and KIENINGER (H). The chemical composition of mother juices prepared from various sorts of morello cherries. *Flussiges Obst*. 47(10); 1980; 494-6 (German)

The analysis of samples of mother juices of morello cherries was carried out by different methods (e.g. enzymatic, spectrophotometric analyses). The composition of the juice is as follows: dry substance 144.0 mg/l, total acid 21.2 g/l, total sugar 121.0 g/l, protein 3.3 g/l and total ash 4.7 g/l. The concentration of the various components may fluctuate within wide limits; nevertheless statistically significant relations among several components could be found. These relations may help to judge the purity of a commercial morello cherry juice. VR

SWEET CHERRY

- 2501 SCHOBINGER (U) and DURF (P). The development of a beverage based on home grown sweet cherries. *Flussiges Obst*. 47(11); 1980; 538-41 (German)

In order to meet a potential surplus production of sweet cherries in Switzerland, the Federal Research Station in Wädenswil got the task to investigate new nonalcoholic outlets for cherries. 20 different varieties of cherries were tested for their suitability in juice production. In addition to the sensory properties, the intensity of the colour and the content of total phenolics are important factors for quality evaluation. The technology of juice and pulpy juice production has been studied. The various problems involved in the development and marketing of a soft drink based on cherries are broadly discussed. Results of a market inquiry with a cherry soft drink are presented. AA

BLACK CURRANT

- 2502 MOLNAR (P). Application of the scoring profile method for the sensory evaluation of Black Currant Juices. *Lebensmittel-industrie*. 27(12); 1980; 549-54 (German)

The profile method was worked out for black currant juices and tested in course of storage tests in order to interpret and summarize the exact and differentiated intensity data. The results confirm the applicability of this method; it can be recommended in research and development and also for the solution of optimization tasks. VR

LEMON

- 2503 BENK (A). Analysis of lemon juice. *Flussiges Obst*. 47(10); 1980; 496-9 (German)

A complete analysis of lemon juice has not been carried out. The available data are incomplete. However, more extensive data have been taken from three English texts and given in this article. As per this data, the constituents of lemon juice are: total acid 83.3 g/l, nitrogen compounds 7.7 g/l, phosphate 797 mg/l and calcium 279 mg/l. In the case of self pressed lemon juices, the data obtained were as follows: ash content 2.1 to 3.9 g/l, potassium 1030 to 1670 mg/l, calcium content 70-160 mg/l. The determination of amino acid content can be carried

out with the help of an amino acid analyser. The important amino acids of lemon juice are alanine 5.4-8.9%, proline 14-25.6% and glutamic acid 10.3-17.4%. VR

APPLE

- 2504 STEINHAUSER (J) and GHERARDI (S). Contribution to the knowledge of Italian concentrated apple juices. *Flussiges Obst*. 47 (11); 1980; 542-4 (German)

31 samples of apples, of apple juice and of apple juice concentrate of the Italian harvest in 1978 and 12 samples of apple juice concentrate of the harvest in 1979 were examined. Large differences between the components examined in '78' and in '79' were observed. When a comparison was made with the mean values for ash, potassium and phosphate to evaluate the concentration of apple juice, it was found that the mean values for the Italian concentrates are too high. Therefore, it was proposed to establish separate mean values for sweet and sour concentrates. VR

- 2505 VYAS (KK) and JOSHI (VK). Applegtone - A new fortified beverage from apple juice. *Indian Food Packer*. 36(3); 1982; 66-73

Applegtone - a new egg yolk based apple beverage was prepared by blending 90% apple juice with 10% egg yolk. The beverage has a total soluble solids of 15 Brix and an acidity of 0.34% as malic acid. It may be stored for 2 months at room temperature without rigorous processing. The beverage (2% egg derived protein, 3% fat and with adequate minerals and vitamins) is nutritionally balanced and provides more calories for equal volume of milk. BSN

- 2506 SHARKASI (TY), BENDEL (RB) and SWANSON (BG). Dilution and solids adulteration of apple juice. *J. Food Quality*. 5(1); 1981; 59-72

The sorbitol/sucrose ratios and the sorbitol/total sugar ratios were determined for the juices of 14 apple varieties and 3 pear varieties. A multivariate normal test was applied to develop an equation for the detection of apple juice adulteration with sugar solutions or pear juice. Adulteration of apple juice with more than 10% sugar solution or pear juice were detectable with this method. AA

- 2507 SHRESTHA (MK) and BHATIA (BS). Apple juice - physico-chemical characteristics and storage study. *Indian Food Packer*. 36(3); 1982; 53-60

Four varieties of apple ((i) American, (ii) Maharaji, (iii) Ambri and (iv) Golden Delicious) were studied for preparation of a clarified blend of apple juice. The best blend may be prepared from a combination of (i) and (ii) in the ratio 1:2 with 2% sugar. The product having 2/3 of low grade apple juice in the blend was found economically feasible. BSN

TEA

- 2508 TAKEO (T). Chemical analysis of aromatic components on semi-fermented tea (Oolong-Pouchung Tea). *J. Jpn. Soc. Food Sci. Technol.* 28(4); 1981; 176-80 (Japanese)

Volatile aromatic components obtained from semi-fermented tea (Pouchung and Oolong tea) were analyzed by the GC-MS method. As main aroma components, terpene alcohols and their oxides, benzyl alcohol, phenylethanol and indole were identified. A total amount of these aroma components con-

tained in high quality tea was larger than that in low grade tea. Most of the aroma components in semi-fermented tea were produced during the manufacturing process. They mostly originated from the non-volatile components by enzymatic breakdown during fermentation process. The composition of the aroma components in made teas were different among varieties. It was suggested that genetic characteristics of each variety were probably related to the composition of aroma components. AA

COFFEE

- 2509 VIJAENDRASWAMY (R) and AHOBALA RAO (KR). Note on development of a grader for grading coffee seeds at estate level. *Indian Coffee*. 46(7); 1982; 163-4
- A machine has been designed for grading coffee seeds according to size - Pea Berry, Plantation 'A', Plantation 'B', 'C', and Triage Bits. It weighs about 80 kg and can grade 1 tonne of coffee in an 8 hours shift. KMD
- 2510 RAJU (KI) and VASUDEVA (N). The distribution pattern of caffeine from seed coffee to seedling in two commercial species of coffee. *Indian Coffee*. 46(7); 1982; 165-170
- Caffeine was present in the leaves, stem, and root portions of 45-day old coffee seedlings, the greatest amount being found in the leaves, and the least in the roots. Seedlings of the *robusta* sp. contained more caffeine *in toto* than seedlings of the *arabica* sp. 90 days after sowing, the caffeine content in the leaves was almost the same as that of the seed, indicating that the leaves are a possible site of caffeine synthesis. KMD
- 2511 LACHANCE (MP). The pharmacology and toxicology of caffeine. *J. Food Safety*. 4(2); 1982; 71-112
- Discusses: physiological actions; toxicity; mutagenicity; carcinogenicity; teratogenicity; and metabolism. BSN
- 2512 GROISSER (DS), ROSSO (P) and WINICK (M). Coffee consumption during pregnancy: Subsequent behavioural abnormalities of the offspring. *J. Nutr.* 112(4); 1982; 829-32
- Offspring of rats fed coffee during pregnancy had reduced body liver, and brain weight at birth. By 30 days postnatally, these animals had recovered in size, but exhibited increased locomotion, decreased grooming time, and decreased time spent with a novel object. Offspring of dams fed decaffeinated coffee demonstrated reduced liver weight at birth and similar behavioural characteristics at 30 days of age. AA

WINE

- 2513 ESCHENBRUCH (R), CRESSWELL (KJ), FISHER (BM) and THORNTON (RJ). Selective hybridisation of pure culture wine yeasts. I. Elimination of undesirable wine-making properties. *Eur. J. Appl. Microbiol. Biotechnol.* 14(3); 1982; 155-8
- Hybridisation has been used to develop new strains of pure culture wine yeasts. Their performance under conditions of microvinification was monitored by fermenting two different grape juices. Four of such hybrid strains produced wines comparable to those obtained by proven strains. Different fermentation performances in different grape juices suggest that strains can be hybridised to suit specific juices. AA

- 2514 THORNTON (RJ). Selective hybridisation of pure culture wine yeasts. II. Improvement of fermentation efficiency and inheritance of SO₂ tolerance. *Eur. J. Appl. Microbiol. Biotechnol.* 14(3); 1982; 159-64

Pure culture wine yeasts vary in their efficiency of conversion of grape sugar to ethanol. Selective hybridisation over three generations gave significant fermentation efficiency, i.e. from 84% to 93%. Sulphur dioxide tolerance was found to be under the control of dominant polymeric genes. Other wine-making characteristics were monitored during the hybridisation programme and selected hybrid strains had wine-making qualities comparable with those of the parent strains, but with increased sugar conversion efficiency. AA

- 2515 SPONHOLZ (WR) and LAMBERTY (P). The HPLC determination of styrene in wine. *Z. Lebensmittel Unters Forsch.* 171(6); 1980; 451-2 (German)

Styrene (vinylbenzene) is eluted from new, uncleaned, polyester tanks by wines if they have not been cleaned adequately before use. Small amounts of styrene (below 0.2 mg/l) destroy the taste and smell of these wines. An HPLC method for a quick and direct analysis is described. AA

OILS AND FATS

- 2516 VAJDI (M), NAWAR (WW) and MERRITT (C) Jr. Effects of various parameters on the formation of radiolysis products in model systems. *J. Am. Oil Chem. Soc.* 59(1); 1982; 38-42
- 2517 LIN (SS), MURASE (Y), MIN (DBS), HSIEH (OAL) and CHANG (SS). Characterization of minor constituents in commercial oleic acid. *J. Am. Oil Chem. Soc.* 59(1); 1982; 42-6
- 2518 MURASE (Y), LIN (SS), MIN (DBS), HSIEH and CHANG (SS). Origin of minor constituents of commercial oleic acid. *J. Am. Oil Chem. Soc.* 59(1); 1982; 47-50
- 2519 LIN (SS), MURASE (Y), MIN (DBS), HSIEH (OAL) and CHANG (SS). Qualitative and quantitative comparison of minor constituents in different commercial oleic acids. *J. Am. Oil Chem. Soc.* 59(1); 1982; 50-51
- 2520 BROSIO (E), CONTI (F), DINOLA (A), SCALZO (M) and ZULLI (E). Oil and water determination in emulsions by pulsed low-resolution NMR. *J. Am. Oil Chem. Soc.* 59(1); 1982; 59-61

SPICES AND CONDIMENTS

- 2521 MABROUK (SS) and EL-SHAYEB (NMA). Inhibition of aflatoxin formation by some spices. *Z. Lebensmittel Unters Forsch.* 171(5); 1980; 344-7

The effects of black pepper, cinnamon, peppermint, cumin, ginger and clove on growth and aflatoxin formation of *Aspergillus flavus* were studied in rice powder/corn steep (RC) medium. The effects of the first five spices were judged to be inhibition of aflatoxin formation rather than of mycelial growth. Clove completely inhibited both mycelial growth and aflatoxin formation at a concentration above 0.1%. No aflatoxin was produced when cumin and mint levels of 5% and 10% were used. Black pepper

and ginger levels of 10% decreased aflatoxin formation by 100%. Higher concentrations of cinnamon, mint, cumin, and ginger stimulated mycelial growth. AA

- 2522 OKADA (Y), AMANO (T), TAKEUCHI (T) and YOSHII (H). On the making of low salt tamari. Study on the reduction of salt concentration in fermented food. Part IX. *J. Jpn. Soc. Food Sci. Technol.* 28(4); 1981; 201-7 (Japanese)

The characteristics of the components were investigated during ripening of low salt tamari (0~9%) prepared by adding ethyl alcohol (2~8% V/W). The pH value and total sugar content were reduced, whereas acidity was increased with decreasing salt concentration to less than 4.5% level. The quality of low salt tamari containing less than 4.5% salt was different remarkably from that of conventional tamari. Solubilization and hydrolysis of soyabean protein were promoted and free amino acids in tamari were increased by decreasing salt concentration. The formation of colour in tamari was not affected by salt concentration, but by ethyl alcohol which showed a tendency to promote the browning slightly. Low salt tamari of less than 4.5% salt contained considerably rich ethyl acetate flavour resulting in lower organoleptic evaluation. However, addition of ethyl alcohol to a conventional tamari in 2% concentration or to low salt tamari containing salt more than 9% was effective to improve the flavour and also, effective to make low salt tamari. From the results mentioned above, 9% salt, as a minimum limit concentration might be suitable for making low salt tamari. AA

- 2523 OKADA (Y), YOSHII (H) and TAKEUCHI (T). On the quality of low salt tamari. Study on the reduction of salt concentration in fermented food. Part X. *J. Jpn. Soc. Food Sci. Technol.* 28(4); 1981; 208-15 (Japanese)

Eight kinds of tamari were prepared by changing the combination ratios of salt in 18~9% range and ethyl alcohol in 0~5% range, in order to study the most favourable combination of salt and ethyl alcohol for making low salt tamari. Common components in six kinds of low salt tamari made in the combination of salt in 15~9% range and ethyl alcohol in 2~5% range were basically similar to those of conventional tamari containing 18% salt, although some difference was observed in pH, acidity, sugar content and the degree of hydrolysis of protein. Conventional tamari not containing ethyl alcohol had a poor flavour and a higher acid value. On the other hand, conventional and low salt tamari made by adding ethyl alcohol had a rich flavour, such as acetaldehyde, ethyl acetate and others, and also provided lower acid value with increasing concentration of the ethyl alcohol. Low salt tamari containing more than 15% salt was excellent in flavour, particularly conventional tamari made by adding 2% ethyl alcohol and 18% salt had the most favourable flavour to indicate the effect of the ethyl alcohol addition for the flavour improvement. AA

SENSORY EVALUATION

- 2524 LUND (DB). Quantifying reactions influencing quality of foods: Texture, flavour and appearance. *J. Food Process. Preserv.* 6(3); 1982; 133-53

Discusses: use of sensory analysis; objective measurement of texture; structure of foods; and quantifying the effects of processing on texture.

BSN

- 2525 HARRIES (JM) and SMITH (GL). The two-factor triangle test. *J. Food Technol.* 17(2); 1982; 153-62

The triangular test, commonly used in sensory tests of food quality, is generally interpreted on the assumption that the probability of a correct selection is the same for all assessors, and independent for separate trials leading to the use of the binomial distribution in setting up tests of significance. Only when there is no real discrimination is it true that using one taster n times is the same as using n tasters once, the basis for the column heading 'number of tasters or tastings' in published tables of significance. This paper attempts to remove this assumption by the use of the beta-binomial distribution, and suggests an interpretation in which the chance of success is different between and within assessors so that a two-factor analysis becomes possible. A set of data relating to the flavour of fish has been reinterpreted in these terms. AA

- 2526 WILLIAMS (AA). Scoring methods used in the sensory analysis of foods and beverages at long Ashton research station. *J. Food Technol.* 17(2); 1982; 163-75

FOOD STORAGE

- 2527 SARID (JN). Storage capacity: its estimation and proper utilization. *Indian Miller.* 13(1/2); 1982; 5-15

This paper discusses the estimation of available storage capacity for food grains to ensure proper utilisation of storage space. MVG

- 2528 PIXTON (SW) and HOWE (RW). The suitability of various linear transformations to represent the sigmoid relationship of humidity and moisture content. *J. Stored Prod. Res.* 19(1); 1983; 1-18

INFESTATION CONTROL AND PESTICIDES

- 2529 MIAN (LS) and MULLA (MS). Residual activity of insect growth regulators against stored-product beetles in grain commodities. *J. Econ. Entomol.* 75(4); 1982; 599-603

The insect growth regulators (IGRs) BAY SIR 8514 (1-(4-trifluoromethoxyphenyl)-3-(2-chlorobenzoyl)urea), diflubenzuron, methoprene, and MV-678 (2-methoxy, 9-(p-isopropylphenyl)2,6-dimethylnonane) were evaluated for residual activity against two internal feeders, *Rhyzopertha dominica* (F.) and *Sitophilus oryzae* (L.) in stored grains for 1 year. The first three at 1 to 10 ppm each gave effective control (98 to 100%) of *R. dominica* in stored wheat, barley, and corn for more than 12 months posttreatment, and MV-678 was the least active. In wheat grain, BAY SIR 8514 at 0.1 and 0.5 ppm was effective against *R. dominica* for 4 and 6 months posttreatment, respectively. Diflubenzuron at 0.1 and 0.5 ppm provided 97 to 98% control for 6 months posttreatment. The residual activity of methoprene at these lower concentrations did not result in appreciable control of *R. dominica*. Data on the residual activity of BAY SIR 8514, diflubenzuron, and methoprene against *S. oryzae* in stored wheat showed that diflubenzuron was more active than BAY SIR 8514 and methoprene. At 5 and 10 ppm this compound gave 100% control at 2-week to 12-month posttreatment interval.

At 1 ppm its residual activity (93.7%) at 2-week intervals gradually increased to as high as 99.8% at 12 months posttreatment. BAY SIR 8514 at 1 ppm showed an almost similar trend in residual activity, ranging between ca. 70% control at 2 weeks posttreatment and 99% control at 12 months posttreatment. At 5 and 10 ppm, this compound provided 96 to 99% control at 2 weeks to 12 months posttreatment. Methoprene tested at 1, 5, and 10 ppm against *S. oryzae* did exhibit residual action which increased with time. Its activity, however, was low, and even at 10 ppm it gave only 80 to 93% control at various intervals during the test period. AA

- 2530 BUSCARLET (LA). Effects of γ -irradiation on respiration and on food consumption measured through ^{22}Na in *Tribolium confusum* J. Du V. (Coleoptera: Tenebrionidae). *J. Stored Prod. Res.* 19(1); 1983; 19-24

Measurements of food consumption in *Tribolium confusum* through ^{22}Na accumulation or ^{22}Na clearance were compared. The two methods had specific characteristics with regard to usefulness, accuracy and the need for calibration. Food consumption, measured by ^{22}Na accumulation, and respiration were compared in adult males and females submitted to various doses of irradiation (10-200 Gy). It was observed that irradiation decreased both food consumption and respiration, its effects being stronger on the former than on the latter. It was also shown that irradiation had no damaging effects on sodium regulation or on carbon utilization. From a more practical point of view it was concluded that ^{22}Na could occasionally be a useful tool for testing insect infestation in foodstuffs. AA

- 2531 LONGSTAFF (BC) and DESMARCHELIER (JM). The effects of the temperature-toxicity relationships of certain pesticides upon the population growth of *Sitophilus oryzae* (L.) (Coleoptera: Curculionidae). *J. Stored Prod. Res.* 19(1); 1983; 25-9

An experiment to assess the effects of temperature upon the toxicity of two pesticides to *Sitophilus oryzae* is described. The pesticides used, pirimiphos-methyl and deltamethrin, were shown to have opposite relationships with temperature. The consequences of these relationships are discussed in relation to the population growth of *S. oryzae* and, in particular to the use of cooling in combination with low levels of pesticide as an integrated control measure for this and other pest species. AA

- 2532 TAHER (M) and CUTKOMP (LK). Effects of sublethal doses of DDT and three other insecticides on *Tribolium confusum* J. Du V. (Coleoptera: Tenebrionidae). *J. Stored Prod. Res.* 19(1); 1983; 43-50

- 2533 JASDEEP SINGH and MURALI (HS). Rodents, cereal foods and human health. *Indian Food Packer.* 36(3); 1982; 23-8

Aspects covered include, rodents and food industry, rodents and human health; rodent behaviour and binomics; antirodent measures including sanitation measures, trapping, rodenticides; acute and chronic toxicants, fumigation, chemosterilants and other methods like the use of ultrasonic machines and foaming polyurethane resins containing rodenticides. BSN

BIOCHEMISTRY AND NUTRITION

- 2534 TOPP (NB). You are what you eat. *J. Food Prot.* 44(7); 1981; 556-9
There has been a major debate in the U.S., after the Senate's Committee on Nutrition and Human Needs announced the dietary goals for the U.S., and proposed guide-lines for wise food selection. The latter support a low cholesterol, low saturated fat, high polyunsaturated fat, and high fibre diet for all healthy Americans. KMD
- 2535 TREUHERZ (J). Possible interrelationships between zinc and dietary fibre in a group of lacto-ovo vegetarian adolescents. *J. Plant Food.* 4(2); 1982; 89-93
- 2536 KIRKPATRICK (DC), CONACHER (HBS), MERANGER (JC), DABEKA (R), COLLINS (B), MCKENZIE (AD), LACROIX (GMA) and SAVARY (G). The trace element content of Canadian baby foods and estimation of trace element intake by infants. *Can. Inst. Food Sci. Technol. J.* 13(4); 1980; 154-61
- 2537 CHANDRASEKHARA (HN) and BALASUBRAHMANYAM (N). Moisture sorption and storage of weaning food. *Indian Food Packer.* 36(3); 1982; 77-83
Moisture sorption studies of weaning food with and without added fat under different RH at 27 C have been carried out. The weaning food kept at room temperature (27 C) exhibited typical sigmoid type sorption isotherm and that a moisture content of 6.8% (d.w.b.) corresponding to 44% R.H. is critical for caking i.e. loss of free flow properties of the product. The weaning food packed in 100 g units in 300 gauge LDPE pouches and placed in tin container could be stored for 5 months either at room temperature or at 37 C without any off-flavour development due to rancidity. The product was in acceptable conditions. AA
- 2538 PHILLIPS (RD). Modification of the saturation kinetics model to produce a more versatile protein quality assay. *J. Nutr.* 112(3); 1982; 468-73

TOXICOLOGY AND HYGIENE

- 2539 REYES (AL), CRAWFORD (RG), WEHBY (AJ), PEELER (JT), WIMSATT (JC), CAMPBELL (JE) and TWEDT (RM). Heat resistance of *Bacillus* spores at various relative humidities. *Appl. Environ. Microbiol.* 42(4); 1981; 692-7
- 2540 MONTVILLE (TJ). Effect of plating medium on heat activation requirement of *Clostridium botulinum* spores. *Appl. Environ. Microbiol.* 42(4); 1981; 734-6
- 2541 BENNETT (GM), SEAVER (A) and CALCOTT (PH). Effect of defined lipopolysaccharide core defects on resistance of *Salmonella typhimurium* to freezing and thawing and other stresses. *Appl. Environ. Microbiol.* 42(5); 1981; 843-9
- 2542 SNOOK (RJ), MCKAY (LL) and AHLSTRAND (GG). Transduction of lactose metabolism by *Streptococcus cremoris* C3 temperate phage. *Appl. Environ. Microbiol.* 42(5); 1981; 897-903

- 2543 SNOOK (RJ) and McKAY (LL). Conjugal transfer of lactose-fermenting ability among *Streptococcus cremoris* and *Streptococcus lactis* strains. *Appl. Environ. Microbiol.* 42(5); 1981; 904-11
- 2544 DUNSMORE (DG). Bacteriological control of food equipment surfaces by cleaning systems. I. Detergent effects. *J. Food Prot.* 44(1); 1981; 15-20
 Four cleansing and sanitizing systems for stainless steel surfaces coming in contact with milk have been studied. The detergent was found to be the most important system component for controlling bacterial numbers, with the sanitizer contributing some control, and the rinses very little. KMD
- 2545 SHANTHA (T) and SREENIVASA MURTHY (V). Influence of tricarboxylic acid cycle intermediates and related metabolites on the biosynthesis of aflatoxin by resting cells of *Aspergillus flavus*. *Appl. Environ. Microbiol.* 42(5); 1981; 758-61
 Resting cells of *Aspergillus flavus* synthesized aflatoxin from acetate as the sole carbon source after 36 hours of incubation. Addition of pyruvate (5.5 mg/ml) as cosubstrate to (1-¹⁴C) acetate and unlabeled acetate considerably reduced toxin production, but increased the radioactivity on the tricarboxylic acid intermediates. This suggests that high tricarboxylic acid activity drastically affected toxin synthesis. AA
- 2546 YOUSEF (AE), EL-GENDY (JM) and MARTH (EH). Growth and biosynthesis of aflatoxin by *Aspergillus parasiticus* in cultures containing nisin. *Z. Lebensmittel-Unters. Forsch.* 171(5); 1980; 341-3
 Nisin, 200 or 5000 reading units/ml, was added to *Aspergillus parasiticus* cultures. The cultures were incubated at 28 C for 3, 7 or 10 days and analyzed for mycelial dry weight, pH and accumulation of aflatoxin B₁ and G₁. During the first three days of incubation, dry weight, pH decrease, and aflatoxin accumulation were suppressed by nisin, when compared with similar values for the nisin free control. After longer incubation, differences in dry weight and pH values decreased, whereas accumulation of aflatoxin in the nisin-containing cultures surpassed that of the control. AA
- 2547 PARKER (RW), PHILLIPS (TD), KUBENA (LF), RUSSELL (LH) and HEIDELBAUGH (ND). Inhibition of pancreatic carboxypeptidase A: A possible mechanism of interaction between penicillic acid and ochratoxin A. *J. Environ. Sci. Health.* B17(2); 1982; 77-91
- 2548 GERTZ (C) and BOSCHEMEYER (L). A screening method for the determination of various mycotoxins in food. *Z. Lebensmittel Unters. Forsch.* 171(5); 1980; 335-40 (German)
 A simple analytical method for multiple mycotoxins was developed for detecting aflatoxin B₁, B₂, G₁, G₂, M₁ and M₂, sterigmatocystin, penicillin acid. Ochratoxin A and patulin. These mycotoxins were extracted with ethyl acetate. The extract was cleaned up by chromatography on silica mini-column. Each fraction was separated by thin layer chromatography. The final evaluation of the TLC plates was carried out by fluorodensitometry. A considerable increase in fluorescence intensity was achieved by spraying the plates with paraffin after development. The detection limits of fluorescent mycotoxins and fluorescent derivatives of penicillic acid and sterigmatocystin were lowered to 1:10 upto 1:100. Spots of patulin were measured by fluorescence quenching. AA

- 2549 MILLER (S) and SHAH (MA). Cholinesterase activities of workers exposed to organophosphorus insecticides in Pakistan and Haiti and an evaluation of the tintometric method. *J. Environ. Sci. Health.* B17(2); 1982; 125-42
- 2550 ZOTTOLA (EA) and WOLF (ID). Recipe Hazard Analysis - RHAS : A systematic approach to analyzing potential hazards in a recipe for food preparation/preservation. *J. Food Prot.* 44(7); 1981; 560-64

A Recipe Hazard Analysis System (RHAS), based on the Hazard Analysis Critical Control Point (HACCP) concept, has been developed to analyze potential hazards in food preservation or food processing. The system has been used to identify potential hazards in several recipes: e.g. home canned sandwich spread, South American meat sauce, pumpkin butter, zucchini catsup, and dill pickles (vinegarless). Worksheets and the method of analysis have been presented. KMD

GENERAL

- 2551 GRAVENS (WW). Plants and animals as protein sources. *J. Anim. Sci.* 53(3); 1981; 817-26

FOOD PROCESSING AND PACKAGING

PROCESSING

- 2552 LUND (DB). Considerations in modeling food processes. *Food Technol.* 37(1); 1983; 92-4
- 2553 CUEVAS (R) and CHERYAN (M). Heat transfer in a vertical, liquid-full scrapped surface heat exchanger. Application of the penetration theory and Wilson plots models. *J. Food Process. Eng.* 5(1); 1982; 1-21
Heat transfer characteristics of a scraped-surface heat exchanger (Contherm Model 6 x 2) were evaluated at ultra high temperatures using water and soyabean water extracts as model systems. The resistance equation was used to calculate internal (scraped-side) heat transfer coefficients (h_i) from the overall heat transfer coefficient, the wall coefficient and the external (steam-side) coefficient (calculated from the Nusselt Theory using an iteration procedure). The Penetration Theory of Harriot (1958) predicted h_i values quite well at low axial mass flow rates, where laminar flow conditions prevail. However, turbulent axial flow resulted in experimental h_i greater than predicted by the theory. A correction factor based on Prandtl number suggested by Trommelen et al. (1971) did not improve the prediction. The Wilson Plots method was useful for explicitly accounting for axial and rotational velocity effects, both of which significantly affected heat transfer, especially at high values of either variable. AA
- 2554 HAYAKAWA (K-I) and DOWNES (TW). New parametric values for thermal process estimation by using temperatures and z values expressed in degree Celsius units. *Food Sci. + Technol.* 14(2); 1981; 60-64
Tables of new parametric values were prepared for the estimation of heat sterilization processes by modifying those prepared previously by the senior author. These values may be used to calculate mass average sterilizing values as well as sterilizing values at critical points in food by using temperature data and process constants expressed in degree Celsius. Errors in dimensionless sterilizing values, which are obtained through the linear interpolation of tabulated parametric values, are mathematically examined. AA
- 2555 HAYAKAWA (K-I), MATSUDA (N), KOMAKI (K) and MATSUNAWA (K). Computerized estimation of reaction kinetic parameters for thermal inactivation of microorganisms. *Food Sci. + Technol.* 14(2); 1981; 70-78
- 2556 PEI (DCT). Microwave baking - new developments. *Baker's Digest.* 56(1); 1982; 8,10,32
The author has first analysed the bread making process under four different stages; use of microwave energy exclusively for baking and conventional baking and microwave combination effect, have been covered in this study. KAR

- 2557 CROSS (GA) and FUNG (DYC). The effect of microwaves on nutrient value of foods. *CRC Crit. Rev. Food Sci. Nutr.* 16(4); 1982; 355-81
Discusses: effect of microwaves on; moisture; proteins; carbohydrates; lipids; minerals and vitamins in foods. BSN
- 2558 HALL (G). Food dehydration developments. *Food Technol. NZ.* 17(7); 1982; 41,43
General article dealing with the current trends in dehydration technology and the future of dehydration system in New Zealand and some other countries. KAR
- 2559 BOLIN (HR) and SALUNKHE (DK). Food dehydration by solar energy. *CRC Crit. Rev. Food Sci. Nutr.* 16(4); 1982; 327-54
Discusses: drying methods using only solar energy; drying with solar plus auxillary energy source; product evaluation; and economics. BSN
- 2560 DIEHL (JF). Irradiation of foods. Present position and perspectives. *Rev. Agroquim. Tecnol. Aliment.* 21(1); 1981; 23-34 (Spanish)
This review briefly covers: (i) possible applications of food irradiation; (ii) economics of food irradiation; (iii) the safety, as regards health of irradiated foods; (iv) the legal position as regards irradiated foods; and (v) perspectives of the industrial utilization of food irradiation. KMD
- 2561 HEINS (HG). Food irradiation: Dutch experiences with practical applications and present status in the Netherlands. *IFST Proc.* 15(2); 1982; 80-83
The author points out about the trial sale of irradiated mushroom and irradiated fresh fish fillets and gives reason for not succeeding. KAR
- 2562 ANON. Radiation preservation of foods. *Food Technol.* 37(2); 1983; 55-60
Aspects covered include application of radiation to food preservation, radiation pasteurization, radiation sterilization, advantages of radiation processing, other foods where irradiation is applied, consideration about wholesomeness and regulation of irradiation processing. KAR
- 2563 MARKS (JS). Defining terms for measuring food losses during processing. *Food Technol.* 37(2); 1983; 69-70
The terms yield, loss and waste have been defined. KAR
- 2564 VON ELBE (JH), SCHWARTZ (SJ) and ATTOE (EL). Using appropriate methodology to predict food quality. *Food Technol.* 37(1); 1983; 87-91
- 2565 GREGORY (JF) III. Methods of vitamin assay for nutritional evaluation of food processing. *Food Technol.* 37(1); 1983; 75-80
The review covers method of extraction and analysis, microbiological assays, automated spectrophotometric analyses, high performance liquid chromatography, ligand binding assays, enzymatic assays and methods for evaluating biological activity. The areas which need further research have also been indicated. KAR
- 2566 NAKAYAMA (TOM), ALLEN (JM), CUMMINS (S) and WANG (YYD). Disinfestation of dried foods by focused solar energy. *J. Food Process. Preserv.* 7(1); 1983; 1-8
Temperatures in excess of 50° produced by focused solar dryers can be used for disinfestation of dried foods. All life stages of the hide beetle

Dermestes maculatus, were eliminated from dried mullet in a single exposure of 30-60 minutes. The same results were obtained with the Indian meal moth, *Plodia interpunctella* with dried peaches and with the merchant grain beetle, *Oryzaephilus mercatus* on oatmeal. Among packaging materials, black plastic was shown to be most effective followed by clear plastic. Aluminium foil was found to be reflective and resulted in lower temperatures within the container. The lethality of oven, microwave, and infrared heating units were also tested on the life stages of the hide beetles. AA

- 2567 KNORR (D). Recovery of functional proteins from food processing wastes. *Food Technol.* 37(2); 1983; 71-6
Methods of utilizing processing wastes; processing of functional proteins; functionality and factors affecting it, effect of coagulation method and effect of dehydration method are the aspects discussed. KAR
- 2568 ARNEMANN (H). Palletising, storage and shipment of mill products. *Getreide Mehl. Brot.* 35(1); 1981; 9-13
- 2569 WOLF (W), METNI (M) and SPIESS (WEL). Export oriented deep frozen products. The time-temperature behaviour of some deep frozen ready-meat ethnic foods from the Near East. *Gordian.* 81(1-2); 1981; 24-8 (German)
The three ready-to-eat ethnic foods, kebbeh, hommos and sambussik are especially suitable for quick freezing and deep freeze storage; the sensoric properties, immediately after the deep freezing process, are comparable with those of freshly prepared foods of the same sort. The quality of the foods, after six months' deep freeze storage at temperatures of -18 C and below, was still very good. The samples stored at -12 and 12 ± 3 C suffered a lowering of quality; they were, however, still judged as satisfactory. AA

PACKAGING

- 2570 PFLUG (IJ), DAVIDSON (PM) and HOLCOMB (RG). Incidence of canned food spoilage at the retail level. *J. Food Prot.* 44(9); 1981; 682-5
- 2571 DAVIDSON (PM), PFLUG (IJ) and SMITH (GM). Microbiological analysis of food product in Swelled-cans of low-acid foods collected from supermarkets. *J. Food Prot.* 44(9); 1981; 686-91
- 2572 DAVIDSON (PM) and PFLUG (IJ). Leakage potential of swelled cans of low-acid foods collected from supermarkets. *J. Food Prot.* 44(9); 1981; 692-5, 698
- 2573 HEMMING (ML). Canning wastes and their treatment. *Food Process. Ind.* 50(597); 1981; 23,26-7
- 2574 SUBRAMANIAN (MR). Packaging - New dimensions. *Perfectpac.* 22(2,3); 1982; 14-6
The author has drawn attention to some new products that have become available in India during the last decade; biaxially oriented polypropylene film (BOPP), as also collapsible tubes, and stand-up pouches, made with polypropylene; high-density polyethylene films, and co-extruded films for packing milk; stretch packagings; new packaging systems like moulded plastic cups for yoghurt or jams, or a lined carton system for packing

vanaspati, buttermilk, sugarcane juice; and nylon-reinforced kraft paper and gummed paper tape. KMD

- 2575 MAHADEVIAH (M) and ANANDASWAMY (B). Development of indigenous packaging materials for processed food products. *Indian Food Ind.* 1(1&2); 1982; 33-42
 Discusses: assessment of indigenous hot dipped tinplate; evaluation of indigenous electrolytic tinplate; physicochemical characteristics of indigenous tinplate and shelf life of the canned products; assessment of differential tinplate; internal corrosion in tinplate in canned fruit and vegetable products; tin free steel plate as a substitute; use of flexible packaging material; and bulk containers for packing fruit pulps/juices. BSN
- 2576 BRIGHTON (CA). Styrene polymers and food packaging. *Food Chem.* 8(2); 1982; 97-107
 The review deals with single phase (mass) and suspension polymerisation, polymers of polystyrene, usage for food packaging, expanded polystyrene, weatherability and ageing, and styrene copolymers. KAR
- 2577 SHORTEN (DW). Polyolefins for food packaging. *Food Chem.* 8(2); 1982; 109-19
 Polyolefins are the products of polymerisation of unsaturated aliphatic hydrocarbons. The most important are low density polyethylene, using oxygen or peroxides as catalyst and high density polyethylene, using Ziegler or Phillips catalysts, respectively, in their manufacture. The article covers aspects like the structure of polyolefins, polyethylene copolymers, crystalline nature of polymers, additives incorporated into polyolefins like antioxidants, slip agents, and other additives and the changes occurring during conversion/fabrication process and the regulations in different countries. KAR
- 2578 OSWIN (CR). The selection of plastic films for food packaging. *Food Chem.* 8(2); 1982; 121-7
 The selection of plastic films for biscuits, snack foods, bread, vegetables and red meat are described. KAR
- 2579 SHEPHERD (MJ). Trace contamination of foods by migration from plastics packaging. A review. *Food Chem.* 8(2); 1982; 129-45
 The review covers mechanism and kinetics of migration, effects of polymer properties, migration experiments and testing, effects of extractant properties, foods and food simulating solvents as extractants, overall migration, and migration of monomers and non-volatile plastics components. KAR
- 2580 ANON. Paper sacks. *Food Process Ind.* 50(599); 1981; 44-5
- 2581 GUISE (B). Shrink and stretchwrapping. *Food Process Ind.* 50(599); 1981; 33-4, 37, 40-41
- 2582 PEARSON (RB). PVC as a food packaging material. *Food Chem.* 8(2); 1982; 85-96
 The different types of PVC packaging material - bottles, foil, cling film and cap sealing - and their method of manufacture are described, together with the range of food packaging applications in which they are used. The physical properties of PVC are described and additionally, its

cost and competitiveness with other materials are compared. The chemical nature of PVC compositions arising from the addition of heat stabilisers and plasticisers to achieve the desired properties is also described with particular reference to heat stability. KAR

- 2583 HAHN (H). Plastics for packing foodstuffs. Property profile of marketable types of plastic. *Gordian*. 81(4); 1981; 93-4 (German)
- 2584 ANON. Lids, sealable by heat, for containers made of polypropylene and glass. *Gordian*. 81(3); 1981; 56-7 (German)
- Polypropylene containers can be sealed under the same conditions which hold good for sealing of polystyrene and PVC materials. The lids, made of Al-foil, are provided with a special coat, which proves good for hot and cold milk products and salads. The lids can also be removed easily without any parts of the foil being left on the container. In the case of glass containers the seal must exactly fit into the surface of the glass mouth. The aluminium covering band is 50 μm thick and has a special coat of 12 g/m². Tests conducted on sealed glass containers showed that even after several weeks, the seal did not give way. VR
- 2585 JONES (G). Not just any label, but an EC harmonised label. *Milling Feed Fert.* 165(12); 1982; 15-6, 19

FOOD ENGINEERING AND EQUIPMENT

- 2586 BENDER (W) and REDEKER (D). Progress in the mechanical separation of liquids by filtration. *Chemie Ingenieur Technik*. 53(4); 1981; 227-36 (German)
- Dynamic filtration opens up the possibility to concentrate and wash intrinsically viscous, difficulty filterable suspensions, continuously in closed apparatus to the limit of their flowability. AA
- 2587 NEITZEL (M). Present and future of plastics in chemical plant design. *Chemie Ingenieur Technik*. 53(4); 1981; 237-43 (German)
- 2588 SINGH (HP) and ALAM (A). Development of solar-cum-wind aspirator for drying and ventilation. *J. Agric. Eng.* 19(4); 1982; 63-8
- Aspirators of 0.2, 0.4 and 0.6 m diameter with 2 m height absorbing stacks were fabricated and tested for their performance characteristics. Based on the performance characteristics of solar-cum-wind aspirator, air flow required a 0.25 m diameter and 1.2 m height aspirator was designed and incorporated with the solar cabinet dryer making its performance independent of wind direction and also to achieve the faster drying rate. AA
- 2589 NAG (D) and BHOLE (NG). Design, development and testing of husk separator. *J. Agric. Eng.* 19(3); 1982; 123-7
- The rice husk separator was developed and tested the effectiveness varying from 0.9196 to 0.9292 and with air flow rate of 22.42 m³/minute. which decreased with further increase of air flow. BSN

ENERGY IN FOOD PROCESSING

- 2590 HARRIS (PS). The potential for energy savings in the UK food industry. *IFST Proc.* 15(1); 1982; 2-12
The various aspects covered are: various schemes for energy saving, types of energy use in industry, ways and means of effecting energy savings, including good house keeping and skilful management, modification to existing plant; energy use in new processes, and the energy saving potential in the different food industries like milk and milk products, brewing, malting and some other sectors of the food industry. KAR
- 2591 LEWICKI (P). Research in energy utilisation in the polish food industry. *IFST Proc.* 15(1); 1982; 22-8
- 2592 MASTERS (K) and YOUNGS (RA). Energy saving options available in spray dryer users. *IFST Proc.* 15(1); 1982; 13-21
The paper reviews the options available to both users of spray dryers faced with improving thermal efficiency of existing spray dryers and those projecting new spray drying installations. These options involve heat recuperation where a new plane tube heat exchanger capable of handling powder-laden exhaust air flow is described. Two-stage drying and feed preheating are other alternatives mentioned. KAR
- 2593 MANN (J). Energy savings through improved transportation policies. *IFST Proc.* 15(1); 1982; 29-33

FOOD CHEMISTRY AND ANALYSIS

- 2594 ANON. Food contact materials: Steering group report. *Br. Food J.* 84(909); 1982; 116-7
- 2595 MAGA (JA). Pyrazines in foods: An update. *CRC Crit. Rev. Food Sci. Nutr.* 16(1); 1982; 1-48
Discusses: Food occurrences (tea, nuts, soy products, rice products, egg products, cocoa products, marine products, bread, potato products, meat products, vegetables and others), potential health concerns; flavour properties and pyrazine pathways and synthesis. BSN
- 2596 MAYER (RJ), RUSSELL (SM), WILDE (CJ), BURGESS (R) and SINNETT-SMITH (PA). Protein synthesis and degradation during development. *CRC Crit. Rev. Food Sci. Nutr.* 16(2); 1982; 149-63
- 2597 MADHAV SINGH and KRIKORIAN (AD). Inhibition of trypsin activity *in vitro* by phytate. *J. Agric. Food Chem.* 30(4); 1982; 799-800
In vitro activity of the proteolytic enzyme trypsin using casein as the substrate was substantially inhibited by low levels of phytic acid (myo-inositol hexaphosphate). The possible significance of this finding for protein availability in nutrition is discussed. AA

- 2598 IGLESIAS (HA) and CHIRIFE (J). An equation for fitting uncommon water sorption isotherms in foods. *Food Sci. + Technol.* 14(2); 1981; 105

The new, empirically developed, equation is

$$M = A \frac{a_w}{1-a_w} + B$$

where M is the moisture content on dry basis, a_w is the water activity, and the parameters A and B stand, respectively, for the shape of the straight line, and its intercept on the Y-axis. KMD

- 2599 PRUDEL (M) and DAVIDKOVA (E). Stability of α -L-aspartyl-L-phenylalanine methyl ester hydrochloride in aqueous solutions. *Nahrung.* 25(2); 1981; 193-9

The stability of USAL (α -L-aspartyl-L-phenylalanine methyl ester hydrochloride) was studied in solutions in relation to the pH value (1.10-6.95 at 20 C), the temperature (20-80 C at pH 2.2) and the ionic strength (0.16-2.0 at 20 C and pH 4.0). The effects of pH and temperature of the medium were very significant. From the point of view of the stability, the optimum pH value lies in the pH range 2.5-4.5 and at lower temperature. The ionic strength did not affect the stability in the tested range. The effects of citric acid (0-10%) and sucrose (0-75%) were also investigated. An addition of citric acid exhibited an effect on USAL stability corresponding to the shift of pH value that it caused. The presence of sucrose in the solution had a favourable effect at higher concentrations. AA

- 2600 WALKER (EA), PIGNATELLI (B) and FRIESEN (M). The role of phenols in catalysis of nitrosamine formation. *J. Sci. Food Agric.* 33(1); 1982; 81-8

Phenolic compounds which can potentially form C-nitroso derivatives by reaction with nitrite can act as catalysts on the formation of an N-nitrosamine from nitrite and a secondary amine. In addition, it has been shown that a number of naturally occurring phenols catalyse the formation of NDEA under alkaline conditions and such catalysis can lead to the artifactual formation of nitrosamine during their analysis. KAR

- 2601 MASSEY (RC), FORSYTHE (L) and McWEENY (DJ). The effects of ascorbic acid and sorbic acid on N-nitrosamine formation in a heterogeneous model system. *J. Sci. Food Agric.* 33(3); 1982; 294-8

The effects of competitive nitrosation by ascorbic acid and sorbic acid on N-nitrosamine formation were studied in a heterogeneous protein-ased model system containing a 20% non-aqueous phase. The reactions were examined at 37 C with an aqueous phase pH of 5.25. Under certain conditions ascorbic acid enhanced the nitrosation of secondary amines. The overall extent to which ascorbic acid affected N-nitrosation was found to depend on the time-scale of the reaction and also the phase in which N-nitrosamine formation occurred. Sorbic acid reduced N-nitrosation in both phases of the heterogeneous system. AA

- 2602 WEDZICHA (BL), HILL (D) and COCKSHOT (JB). The reactivity of intermediates in non-enzymic browning reactions towards nitrite ion. *J. Sci. Food Agric.* 33(3); 1982; 306-8

The intermediates of non-enzymic browning reactions, 4,5-dihydroxy-2-oxopentanal and 2-oxo-4,5,6-trihydroxyhexanal, show significant reactivity towards nitrite ion at pH 4.7 and 7.0, respectively. AA

- 2603 HO (C-T) and HARTMAN (GJ). Formation of oxazolines and oxazoles in strecker degradation of Dl-alanine and L-cysteine with 2,3-butanedione. *J. Agric. Food Chem.* 30(4); 1982; 793-4
- 2604 DONG (MW) and DICESARE (JL). Improved food analysis using high-speed liquid chromatography. *Food Technol.* 37(1); 1983; 58-62
The design aspect of HSLC system and the application including those of quality control of soft drinks, phenolic antioxidants, food dyes and colours, vitamins, aflatoxins and other food applications have been very briefly reviewed. KAR
- 2605 WEBER (O) and BEIL (E). A procedure to breakdown organic material by means of oxygen under increased pressure. *Dtsch. Lebensmittel-Rundschau.* 77(10); 1981; 361-3 (German)
The paper reports on a decomposing device that makes it possible to mineralize organic substances in pure oxygen under a pressure of 35 bar in preparation for the subsequent metal analysis. AA
- 2606 ZURCHER (K) and HADORN (H). Water determination as per Karl Fischer performed on various foodstuffs. *Dtsch. Lebensmittel-Rundschau.* 77(10); 1981; 343-55 (German)
Close to 100 different foodstuffs were submitted to water determination as per Karl Fischer as well as to conventional alternative methods. Results were discussed, with the most favourable Karl Fischer variant being recommended in each case. AA
- 2607 ARNTFIELD (SD) and MURRAY (ED). Determination of amide nitrogen in plant proteins using an ammonia electrode. *Can. Inst. Food Sci. Technol. J.* 14(3); 1981; 227-9
The use of an ammonia electrode for determination of ammonia released from asparagine and glutamine residues during mild acid hydrolysis has been investigated. Comparison of this technique to a Conway microdiffusion method and a technique employing an amino acid analyzer gave values which were not significantly different ($P=0.05$) from those produced with the amino acid analyser. Both however, gave results higher than those obtained with Conway microdiffusion. The precision of the electrode technique was good with a coefficient of variation of 4.5%. The ease of operation and reduced time for analysis make the ammonia electrode technique most useful in quantitating amidated glutamic and aspartic residues.
- 2608 ROY CLARK (E) and YACIOUB (EAK). Determination of saccharin by desorption of ferroin from silica gel. *Analyst.* 107(1273); 1982; 414-21
Ferroin is strongly adsorbed on silica gel, but its ion-association complexes are easily desorbed. A simple, rapid and accurate procedure for the determination of saccharin has been devised utilising these properties. The procedure is based on the quantitative formation of the ion-association complex $((\text{Fe phen}_3)_2 (\text{saccharin})_2)$ when saccharin dissolved in water, 60% aqueous ethanol, 70% aqueous acetone or 80% aqueous methanol is shaken with ferroin-impregnated silica gel. The absorbance of the characteristic orange colour of the ferroin ion-association complex is measured at 510 nm. There are no interferences from glucose, sucrose and dulcin even when these constituents are present at 1,600 times the concentration of saccharin. Sodium cyclamate, sorbic acid, benzoic acid, citric acid and sodium chloride give positive errors. Although the presence of sodium hydrogen carbonate results in a low recovery of saccharin, this compound may be eliminated easily by the addition of dilute sulphuric acid. AA

- 2609 BHATTACHARYA (KR) and SOWBHAGYA (CM). An abridged Brabender viscograph test. *Food Sci. + Technol.* 14(2); 1981; 79-81
- A rapid Brabender viscograph test has been developed. Heating of the slurry is begun by setting the thermoregulator at 60 C, the time of constant temperature heating at 95 C is shortened to 10 minutes and cooling is started by setting the thermoregulator at 70 C. Slurry weight is kept at 400 g. Besides, the cooling probe is kept permanently lowered for a smoother curve. A 50% saving in time and 20% saving in flour weight with essentially identical trend of results compared with the standard test procedure are achieved. AA
- 2610 POWERS (JJ), WARREN (CB) and MASURAT (T). Collaborative trials involving three methods of normalizing magnitude estimations. *Food Sci. + Technol.* 14(2); 1981; 86-93
- To evaluate three methods of normalizing magnitude estimations (ME) and intra- and inter-laboratory agreement, panelists of 20 laboratories judged the coarseness of sandpaper by feel. Of 257 panelists involved, 216 performed in a satisfactory manner as judged by the regression of ME on grit designation. Normalization accomplished by averaging, using an internal standard and by using a separate calibration step led to essentially the same results. AA
- 2611 VIGO (MS), CHIRIFE (J), SCORZA (OC), CATTANEO (P), BERTONI (MH) and SARRAILH (P). A study on traditional intermediate moisture foods produced in Argentina. Determination of water activity, pH, moisture content and soluble solids. *Rev. Agroquím. Tecnol. Aliment.* 21(1); 1981; 91-9 (Spanish)
- 2612 MOLL (N), GROSS (B), VINH (T) and MOLL (M). A fully automated high-performance liquid chromatographic procedure for isolation and purification of Amadori compounds. *J. Agric. Food Chem.* 30(4); 1982; 782-6
- A semipreparative reversed-phase high-performance liquid chromatographic (HPLC) method was developed for the separation and purification of Amadori compounds from crude extracts of Maillard reactions. The Amadori compounds alanine-fructose (Ala-Fru), leucine-fructose (Leu-Fru), hydroxyproline-fructose (Hyp-Fru), and tryptophan-fructose (Trp-Fru) were isocratically separated on a NH_2 -bonded silica gel column by using methanol-water (80:20) as the mobile phase. The collected fractions containing the Amadori compounds were concentrated and chromatographed a second time under the same conditions for further purification. Pure products were obtained by crystallization from anhydrous methanol of the fractions obtained after evaporation. The purities of the Amadori compounds were tested by thin-layer chromatography (TLC) and HPLC; their structures were confirmed by infrared spectrometry, ^{13}C NMR, and mass spectrometry. AA
- 2613 HEANEY (RK) and FENWICK (GR). The quantitative analysis of indole glucosinolates by gas chromatography - The importance of the derivatisation conditions. *J. Sci. Food Agric.* 33(1); 1982; 68-70
- The effect of derivatisation conditions on the quantitative analysis of indole glucosinolates as the desulphated trimethylsilyl derivatives using gas chromatography is examined. Structures for the trimethylsilyl derivatives of glucobrassicin and neoglucobrassicin are suggested from an analysis of their ammonia chemical ionisation mass spectra. Caution is urged in the analysis of these compounds without prior optimisation of the conditions of derivatisation. AA

- 2614 LINDBLOM (M) and BIRKHED (D). Analysis of sugars in foods by GLC and HPLC. *Var Foda*. 32(10); 1980; 533-8 (Swedish)

The contents of glucose, fructose, sucrose, lactose, maltose and sorbitol in different kinds of food products have been determined by gas-liquid chromatography (GLC) and high-performance liquid chromatography (HPLC). The correlation between the results from the two methods was good. 90 ± 9 per cent of the amount of sucrose in the samples, calculated from the production recipes, was recovered by GLC. The corresponding figure for HPLC was 102 ± 10 per cent. Both methods gave a variation in the results from the triplicate analysis of the individual samples of approximately 5 per cent. AA

- 2615 WIEBE (HH), KIDABMI (RN), RICHARDSON (GH) and ERNSTROM (CA). A rapid psychrometric procedure for water activity measurement of foods in the intermediate moisture range. *J. Food Prot.* 44(12); 1981; 892-5

- 2616 HELLWIG (E), GOMBOCZ (E), FRISCHENSCHLAGER (S) and PETUELY (F). Detection and identification of caramel colour by means of gel permeation chromatography. *Dtsch. Lebensmittel-Rundschau*. 77(5); 1981; 165-74 (German)

The individual caramel types are subjected to a fractionation of their colouring components in a molecular weight range of 2 million down to 10,000 by means of gel permeation chromatography. The individual types, depending on the sugar used, will produce typical elution diagrams which make it possible to undertake a classification. Test arrangements to separate the caramel preparations are described and the elution patterns, which are also influenced by the adsorptive effect of the gel are displayed in 25 typical diagrams were examined. KMD

- 2617 LEAHY (MM) and WARTHESEN (JJ). The influence of maillard browning and other factors on the stability of free tryptophan. *J. Food Process. Preserv.* 7(1); 1983; 25-39

The influence of various factors on the stability of free tryptophan was evaluated in several reaction systems. After treatment, tryptophan was measured by high performance liquid chromatography. Factors such as heating, protein, and glucose were responsible for tryptophan losses in a system undergoing Maillard browning. Hydrogen peroxide caused extensive losses while pH and light had minimal effect on tryptophan stability in solution. When the stability of tryptophan was compared to lysine and threonine during browning, threonine had the highest retention. At low water activity (0.22), tryptophan had the lowest retention (42%) while at a high water activity (0.75) lysine had the lowest retention (5%). When fortified corn tortillas were made using the typical heat treatment involved in preparation, retention of added lysine and tryptophan was 85-90%. AA

- 2618 SPECHT (H), KARIVS (H) and KUNIS (J). About the manufacture and analysis of refrigeration test substances. *Lebensmittelindustrie*. 28(1); 1981; 12-3 (German)

Several gelatinizing agents were tested for the manufacture of test substances as substitutes of meat. Moreover essential physical properties of such test substances which were used in practice were compared. The so called "Karlsruher Prufmasse" (Karlsruhe test substance) as well as a newly developed CMC freezing test substance, made of water soluble cellulose derivatives were found suitable. AA

FOOD LAWS AND REGULATIONS

- 2619 KORWEK (EL). Legal considerations concerning food irradiation. *Food Technol.* 37(2); 1983; 38-42
- 2620 TAKEGUCHI (CA). Regulatory aspects of food irradiation. *Food Technol.* 37(2); 1983; 44-5
- 2621 THAYER (DW) and HARLAN (JW). Status of the USDA food irradiation programs. *Food Technol.* 37(2); 1983; 46-7

FOOD MICROBIOLOGY

- 2622 RAMACHANDRAN (PA), KULKARNI (BD) and SADANA (A). Analysis of multiple steady states of complex biochemical reactions. *J. Chem. Technol. Biotechnol.* 31(9); 1981; 546-52
- 2623 WEISE (H), SCHELLER (F) and SIEGLER (K). Estimation of glucoamylase activity by the aid of an enzyme electrode. *Nahrung.* 25(2); 1981; 127-33 (German)
- 2624 SADANA (A). A theoretical analysis of the deactivation of an immobilised enzyme in multi-enzyme reactions in fixed-bed and fluid-bed reactors. *J. Chem. Technol. Biotechnol.* 31(9); 1981; 553-64
- 2625 REESE (ET). Elution of cellulase from cellulose. *Process Biochem.* 17(3); 1982; 2,4-6
- 2626 BARRETT de MENEZES (TJ). Starchy materials for alcohol fuel production. *Process Biochem.* 17(3); 1982; 32-5
- 2627 TANGNU (SK). Process development for ethanol production based on enzymatic hydrolysis of cellulosic biomass. *Process Biochem.* 17(3); 1982; 36-40, 42-5, 49
- 2628 ESSER (K) and SCHMIDT (U). Alcohol production by biotechnology. *Process Biochem.* 17(3); 1982; 46-9
- 2629 HAMID (Sh), SHAKIR (N) and BHATTY (MK). Synthetic fat from industrial by-products. I. Microbiological fats from molasses. *Fette Seifen. Anstschm.* 83(1); 1981; 30-2
- When *Penicillium javanicum*, *Rhodotorula rubra*, and *Aspergillus nidulans* were grown on a medium containing sugarcane molasses as carbon source, they produced biomasses that contained 15, 10 and 5% fat respectively. The properties and fatty acid composition of these fats have been reported. Sulphite waste liquor was not a good substitute for glucose as a carbon source in the culture medium. KMD
- 2630 BOISEN (H). Selection of bacterial strains for the food industry and their application in various food products. *IFST Proc.* 15(2); 1982; 55-63

Mainly deals with the fermented foods. Controlled pure culture fermentation has been compared with the traditional fermentation. KAR

- 2631 SPICHER (G). Symposium on "Matters of Present-day Importance in Microbiology" - International Society for Cereal Chemistry, 2-3 June 1981, Zurich. *Deutsche Lebensmittel-Rundschau*. 77(10); 1981; 363-5 (German)
- The following papers were presented at the symposium: Stawicki St : Bacteria as quality factor of the cereal and its milled products (P.363); Poisson (T), Richard-Moland (D) and Cahagnier (B) : Mold fungi as quality factors of the cereal and its milled products. (P.364); Spicher (G) : Mold fungi as causes of the occurrence of mycotoxins in cereals (P.364); Trisviatsky (LA) and Golenkov (VF) (Moscow/USSR) : Processing techniques for the prevention of development of microorganisms during the storage of cereals (P.364); Seiler (DAL) (Chorleywood/Great Britain) : The microbial spoilage of bakery products (P.364); Schmidt (HL) : The microflora of the cereal as quality factor for feeds (P.365) and Mar (A) : The use of microorganisms and their metabolism products during the processing of cereals and cereal milled products (P.366). VR
- 2632 CASOLARI (A), BERTOLI (P) and CASTELVETRI (F). Preliminary study of the thermal characteristics of mesophilic bacteria. *Ind. Conserve*. 56(2); 1981; 92-6 (Italian)

YEAST

- 2633 TONNIUS (FG). Processing of single cell proteins - Reduction of nucleic acid content in bakers' yeast. *Chemie Ingenieur Technik*. 53(4); 1981; 279 (German)
- 2634 GONZALEZ (MJ), HERNANDEZ (LM) and BALUJA (G). Biological significance of polychlorinated biphenyls in the medium. III. Effects on the biosynthesis of lipids and fatty acids in *Saccharomyces cerevisiae*. *Rev. Agroquim. Tecnol. Aliment*. 21(1); 1981; 81-90 (Spanish)
- The biosynthesis of lipids in an yeast (*Saccharomyces cerevisiae*) biomass decreased as the quantity of chlorine in the PCB contaminant increased. When the chlorine content of the PCB was high, there was a slight stimulation of lipid production in non-fermentable media. The quantity of PCB in the fermentation media used for these experiments varied from 10 to 50 ppm. KMD

ALGAE

- 2635 VEBER (K), ZAHRADNIK (J), BREYL (I) and KREDL (F). Toxic effect and accumulation of atrazine in algae. *Bull. Environ. Contam. Toxicol*. 27(6); 1981; 872-6
- 2636 YANAGIMOTO (M) and SAITOH (H). Evaluation tests of a large spiral blue green alga, *Oscillatoria* sp., for biomass production. *J. Ferment. Technol*. 60(4); 1982; 305-10
- A large spiral blue green algae, *Oscillatoria* sp. obtained from Chad Lake showed better growth compared to *S. platensis*. Almost all cells of *Oscillatoria* sp. were caught by a sieve of 250 μ m openings compared to 37 μ m sieve needed for *S. platensis*. Compared with *S. platensis*, the

contents of total carotenoids and total phycobilins were greater in the sample of *Oscillatoria* sp. KAR

- 2637 NARASIMHA (DLR), VENKATARAMAN (GS), DUGGAL (SK) and EGGUM (BO). Nutritional quality of the blue-green alga *Spirulina platensis* Geitler. *J. Sci. Food Agric.* 33(5); 1982; 456-60
- The nutritional quality of the blue-green alga *Spirulina platensis* has been evaluated on the basis of its chemical and amino acid compositions and feeding trials with rats. The protein content of the alga was 58.5%, lysine 4.34 g 100 g⁻¹ protein, sulphur-containing amino acids (methionine and cystine) 2.77 g 100 g⁻¹ protein, and nucleic acids 4%. The true protein digestibility of the alga was found to be 75.5 and its biological value (BV) 68. Supplementation of the alga with methionine (0.2%) resulted in a significant improvement in the BV and net protein utilisation (NPU), but had no effect on true digestibility (TD). TD, BV and BPU were significantly improved when the alga was supplemented with barley (50% nitrogen from both). In Chad and Mexico the alga has been used for centuries as a food. This together with its low cost of production, makes it a suitable source of high quality protein for use as a feed supplement. AA
- 2638 KRISHNAKUMARI (MK), RAMESH (HP) and VENKATARAMAN (LV). Food safety evaluation: Acute oral and dermal effects of the algae *Scenedesmus acutus* and *Spirulina platensis* on albino rats. *J. Food Prot.* 44(12); 1981; 934-5,957
- The algae *Scenedesmus acutus* and *Spirulina platensis* have been considered for use as a supplementary protein in feed and food. This Institute has developed the technology of production and utilization of such algae. It is essential to demonstrate their safety in view of their public health aspects, the interest of the producers and image of these new sources of foods. Both these algae, when in pure form and administered to rats orally up to the dosage of 800 mg/kg of body weight, did not exert any toxic action. No alterations were found in either body or organ weights in the treated animals. The vital organs showed normal histology. Application of both algae onto the skin of albino rats, up to 2000 mg/kg of body weight did not elicit any skin allergy. All the animals were normal. AA

FUNGI

- 2639 SEIFERT (RM) and DOUGLAS KING Jr. (A). Identification of some volatile constituents of *Aspergillus clavatus*. *J. Agric. Food Chem.* 30(4); 1982; 786-90
- 2640 KUNZ (B). Investigations on the effect of temperature on suspensions of spores from selected *Penicillium* spp. *Nahrung.* 25(2); 1981; 185-91 (German)
- Cultures of *Penicillium* spp. (predominantly *P. candidum*, *P. camemberti* and *P. roqueforti*) are widely used in the food industry. The present paper deals with the results from studies on the temperature-dependent limits of viable cells of *Penicillium* spp. as a function of the duration of the influence of temperature. An attempt has been made, using kinetic, statistical and empirical methods, to arrive at generalizable statements concerning the temperature behaviour of these *Penicillium* spp. Finally, the absolute need to provide knowledge on process planning in microbial engineering has been pointed out. AA

- 2641 CHOPRA (AK), CHANDER (H), SATISH (VK) and RANGANATHAN (B). Factors affecting lipase production by *Mucor racemosus*. *J. Food Prot.* 44(9); 1981; 661-4
- 2642 COLE (RJ). Fungal tremorgens. *J. Food Prot.* 44(9); 1981; 715-22
- 2643 NARANIA (K) and REDDY (SM). Synergistic production of pectin lyase and polymethyl galacturonase by *Spegazzinia tessarthra*. *Curr. Sci.* 52(12); 1982; 615

Fungal enzymes have been reported to have been involved in the breakdown of pectic material of plant cell wall and even cause death of cell wall. Therefore, the production of these enzymes by *Spegazzinia tessarthra*, a wood inhabiting fungus, was studied. Both the enzymes were produced and the maximum enzyme production on pectin supplemented medium suggested in adoptive nature of the fungus. It was also observed that the two enzymes act hand in hand and paved efficient cleavage of the pectin. There was a positive correlation between enzyme activity and the vegetative growth of the fungus. MVG

MUSHROOM

- 2644 SEEGER (R) and HUTTNER (W). Calcium in mushrooms. *Dtsch. Lebensmittel-Rundschau.* 77(11); 1981; 385-92 (German)

The calcium content of 406 species (1018 samples) of wild fungi was determined by atomic absorption spectroscopy in an air/acetylene flame. It ranged from > 50 (limit of detection) to 9680 mg/kg dry weight ($x \pm S.E. = 490 \pm 55$ mg/kg), equivalent to < 3 and 3025 mg/kg fresh weight ($x \pm S.E. = 68 \pm 15$ mg/kg). On the average, the calcium content was highest in Polyporaceae and particularly low in Amanitaceae, Russulaceae and Lycoperdaceae. In single fruit-bodies of 10 species, the calcium content always was lowest in the gills or pores and usually was highest in the stem. No concentration had occurred in the fungi as compared to the extractable calcium of the soils. AA

- 2645 OGATA (M), KENMOTSU (K), HIROTA (N) and NAITO (M). Relationship between uptake of mercury vapour by mushrooms and its catalase activity. *Bull. Environ. Contam. Toxicol.* 27(6); 1981; 816-20

FOOD ADDITIVES

- 2646 HILL (A). Food additives, allergy and cancer. *IFST Proc.* 15(1); 1982; 45-9
- 2647 KIRSCHMAN (JC). Evaluating the safety of food additives. *Food Technol.* 37(3); 1983; 75-6, 78-9

After reviewing the efforts made to intensify the testing of food additives for carcinogenic effects, the author discusses the approaches followed by Food Safety Council; Squire; Weisburger and Williams; EPA; FDA; and finally Stofberg and Stoeffelsma. KAR

- 2648 KABARA (JJ). Food-grade chemicals for use in designing food preservative systems. *J. Food Prot.* 44(8); 1981; 633-47

A "systems" approach to food preservation has been developed using three common food additives: (a) monolaurin (or lauricidin), (b) food-grade

phenolics, and (c) a chelator. The use of (a) as a preservative is new; it has been shown to be more effective than propionates, benzoates, or even sorbic acid. The common anti-oxidants, BHT & BHA which fall under (b), have been shown, since 1967, to affect a number of micro-organisms, including viruses. The chelator, EDTA, has weak biocidal activity of its own; but it can also potentiate the effect of (a) and (b), particularly against gram-negative bacteria. The amounts and ratios of the three components are determined by the specific need for microbiological protection. KMD

- 2649 SOFOS (JN) and BUSTA (FF). Antimicrobial activity of sorbate. *J. Food Prot.* 44(8); 1981; 614-22

This paper reviews the significant developments relating to use of sorbate as a food preservative - its antimicrobial effects, applications, advantages and limitations. A summary of the current status as well as unanswered questions relevant to the mechanism(s) through which the compound exerts its antimicrobial activity also is presented. AA

- 2650 ELLIOTT (PH) and GRAY (RJH). *Salmonella* sensitivity in a sorbate/modified atmosphere combination system. *J. Food Prot.* 44(12); 1981; 903-8, 916

- 2651 DuBOIS (GE) and STEPHENSON (RA). Dihydrochalcone sweeteners. Synthesis, sensory evaluation, and chiral eluant chromatography of the D and L antipodes of a potently sweet, sucrose-like homoserine-dihydrochalcone conjugate. *J. Agric. Food Chem.* 30(4); 1982; 676-81

The D and L antipodes of the potently sweet homoserine-dihydrochalcone conjugate 2,3',6-trihydroxy-4-(3-amino-3-carboxypropoxy)-4'-methoxydihydrochalcone (1) were synthesized by alkylation of hesperetin (2) with D and L iodides 15, followed by hydrogenation in alkali. The D and L alkylating agents were prepared in six steps from D- and L-methionine, respectively. Enantiomeric purity was determined unambiguously by chiral eluant high-performance liquid chromatography employing a Cu(II)-L-Asp-L-Phe-OMe system. L-1 was determined to have a solubility 1.8 times that of racemic 1. Enantiomerically pure D-1 and L-1 were determined by sensory panel studies to have taste potencies and qualities comparable to those of DL-1, showing the side chain chirality of 1 to have no effect on sensory properties. AA

- 2652 WOOLLEN (A). Technology resolves flavours dilemma. *Food Process. Ind.* 50(600); 1981; 32-3, 36

- 2653 ANON. How the flavour is sealed? *Food Process. Ind.* 50(600); 1981; 36,37

- 2654 MULCAHY (M). Flavour and its challenge. *Food Process. Ind.* 50(600); 1981; 43,47-8

- 2655 FOGG (AG) and WHETSTONE (MR). Differential-pulse polarographic determination of Red 10B formed from the permitted food colour Red 2G. *Analyst.* 107(1273); 1982; 455-9

The measurements were made with a PAR-174 A polarographic analyser using a dropping-mercury electrode, a saturated calomel reference electrode and a platinum electrode. A pulse amplitude of 50 mV and a drop time of 2S were used. The procedure enables determination of the extent of

deacetylation of Red 2G (a permitted food colour) during food processing. By deacetylation at 85 C for prlonged periods, the Red 2G gets converted to Red 10B, whereas heating at 130 C results in extensive degradation of the azo group of Red 2G. However, the disadvantage of the procedure is that it cannot be used at concentrations of food colours above 5 ppm due to adsorption characteristics causing interference between the two differential-pulse peaks. BSN

- 2656 BECCI (PJ), HESS (FG), GALLO (MA), JOHNSON (WD) and BABISH (JG). Subchronic feeding study of grape colour extract in beagle dogs. *Food Chem. Toxicol.* 21(1); 1983; 75-7

The effect of feeding Welch's special grape colour powder type BW.AT at dose levels of 7.5 and 15% w/w in the diet for 90 days was studied in beagle dogs. Body-weight gain of male and female dogs at the high dose level was significantly decreased compared with control dogs. No other treatment related effects were seen in food consumption, haematology, clinical chemistry, ophthalmology or gross and histopathological findings. AA

- 2657 BECCI (PJ), HESS (FG), BABISH (JG), GALLO (MA) and VOSS (KA). Reproduction study of grape colour extract in rats. *Food Chem. Toxicol.* 21(1); 1983; 79-83

The effect of Welch's special grape colour powder type BW-AT on reproductive performance was studied through two generations of sprague-Dawley rats and a subchronic study was carried out on the F₁ animals. The grape colour powder at dietary levels of 7.5 and 15.0% (w/w) had no adverse effects on reproductive performance. No toxic effects or pathological changes were noted in rats fed grape colour powder. AA

- 2658 SMITH (JL) and PALUMBO (SA). Microorganisms as food additives. *J. Food Prot.* 44(12); 1981; 936-55

CEREALS

- 2659 REPORT ON THE 32ND CEREAL CHEMISTRY SESSION OF THE CEREAL RESEARCH WORKING GROUP, DETMOLD, 20th - 22nd May 1981. *Dtsch Lebensmittel-Rundschau.* 77(12) 1981; 444-7 (German)

Summaries of the following 14 papers have been presented.

BELITZ (HD), WIESER (H) and SEILMEIER (W) : Comparative researches on cereal proteins: Amide content of the fractions and aminoacid compositions of cystein peptides from partial hydrolysates (P.444); NIERLE (W), ELBAYA (AW), OCKER (HD) and SEIBEL (W) : On the action of lipids during the production of wheat bread. (P.444); JODLBAUER (HD) : Contribution to the quantitative estimation of emulsifiers in baked and paste goods (P.444-5); SCHAFER (W) : Technological effects of emulsifiers (P.445); LANGGUTH (S) : The technological necessity for emulsifiers (P.445); ASQUITH (J) and ELIAS (PS) : Significance and calculation of ADI - values (P.445); KUHNERT (P) : Criteria for the admission of additives (P.445); SPENCER (B) : Use of additives in baked goods in Great Britain (P.445); ALBERTSSON (CE) : Use of additives in baked goods in Sweden (P.446); HILLE (M) : Xanthans and xanthan variants - Properties and use (P.446); GROSSE (L) : Properties of water-soluble cellulose ethers (P.446); BEGTHALER (W) and VOSS (P) : Determination of amylose contents of starches employing their iodine-binding capacity - Amperometric titration in the dimethylsulphoxide/water system (P.446); SCHAFER (W) and SEIBEL (W) : Water uptake and dough yield -

Attempt to define a concept (P.447); VASSILEVA (R), SEIBEL (W) and MEYER (D) : Structural changes of starch in the bread crumb during baking (P.447). KMD

- 2660 HAPPLE (K). Dust and noise protection in mills and grain elevators. *Getriede-Mehl Brot*. 35(3); 1981; 57-9 (German)
- 2661 MOHR (KH). About the kinetics of the water transport within cereal kernels. *Lebensmittelindustrie*. 28(1); 1981; 19-20 (German)
 A simple method for determining the rate of water transport in the cereal kernel has been described. The diffusion coefficients of husked barley ($D = 2.6 \dots 6.0 \cdot 10^{-11} \text{ m}^2/\text{S}$) and peeled rye ($D = 2.4 \dots 4.3 \cdot 10^{-11} \text{ m}^2/\text{S}$) in the temperature range of 10...25 C are average values for the investigated kernel spectra. The mechanism of the water transport in the cereal kernel is discussed. AA
- 2662 POMERANZ (Y). Grain quality standards. *Food Technol. NZ*. 17(3); 1982; 9,11,13
 After reviewing the different tests for determining grain quality, the author discusses about the US grains Standards Act of 1976. KAR
- 2663 ANDERSON (RA). Water absorption and solubility and amylograph characteristics of roll-cooked small grain products. *Cereal Chem*. 59(4); 1982; 265-9
- 2664 LILLARD (DW), SEIB (PA) and HOSENEY (RC). Isomeric ascorbic acids and derivatives of L-ascorbic acid: Their effect on the flow of dough. *Cereal Chem*. 59(4); 1982; 291-6
- 2665 RENDLEMAN (JA). Cereal complexes: Binding of calcium by bran and components of bran. *Cereal Chem*. 59(4); 1982; 302-9
- 2666 RENDLEMAN (JA). Cereal complexes: Binding of zinc by bran and components of bran. *Cereal Chem*. 59(4); 1982; 310-17
- 2667 WILLIAMS (PC) and STARKEY (PM). A modification of the crude fiber test for application to flour. *Cereal Chem*. 59(4); 1982; 318
- 2668 ANON. Dynamic style to weigh non-stop flour. *Milling Feed Fert*. 165(10); 1982; 18-9
- 2669 IRVINE (GN). High fibre cereal products. *Getreide-Mehl Brot*. 35(3); 1981; 69
 While, in European countries, nutritionists are recommending the inclusion of more fibre in the daily diet - mostly in the form of high extraction or whole-grain flours, breakfast cereals, and shredded fruits and vegetables - the consumption of fibre in the Near and Far East is declining because of the establishment of modern flour mills. Thus, for example, "atta" produced in Indian roller flour mills has less fibre than that produced in chakkis. Nevertheless, the consumption of fibre being about 20 times more in the Near and Far East than in Europe, it will be a long time before the evil effects of low fibre consumption are felt. KMD

RICE

- 2670 BHATTACHARYA (KR), RAMESH (BS) and SOWBHAGYA (CM). Dimensional classification of rice for marketing. *J. Agric. Eng.* 19(4); 1982; 69-76
Rice has been traditionally classified in India, for the purpose of marketing, into superfine, fine, medium and coarse. But, despite various attempts, this classification has been largely based on arbitrary criteria. It is shown that a rational classification requires a single, uniform scale formed by a suitable mathematical derivation from the three parameters, L (length), B (breadth) and w (grain weight). Surface area per unit weight (S, cm²/g) is one such derived parameter which can be an excellent basis of classification; the larger its value, the finer is the grain. The grain weight (w) alone gives a slightly less accurate but rough and ready basis for classification (in the inverse order). AA
- 2671 HAMAD (MA). Thermal characteristics of rice hulls. *J. Chem. Technol. Biotechnol.* 31(10); 1981; 624-6
Evaluation of the thermal characteristics of rice hulls is described. Decomposition was negligible below 200 C, but on heating above 200 C, the amount of volatile matter evolved increased steadily with increasing temperature up to 450 C, where > 90% of the total volatile matter was separated. Decomposition is rapid and is temperature dependent. The effect of temperature on the composition of the residues is also described. The carbon content of the residues increased while the oxygen and hydrogen content decreased sharply when the temperature of pyrolysis was increased. AA
- 2672 PATIL (RT), BAL (S) and MUKHERJEE (RK). Effect of parboiling treatments on rice quality characters. *J. Agric. Eng.* 19(3); 1982; 91-7
Comparative evaluation of rice quality characters was made for commercially adopted parboiling methods viz, Single steaming, Double steaming, CFTRI and Pressure parboiling. The quality characters viz, milling quality, hardness of brown rice, colour, chalky grains, cooking quality, nutritional quality and oil content were evaluated and compared. AA
- 2673 BHAT (RV), DEOSTHALE (YG), ROY (DN), VIJAYARAGHAVAN (M) and TULPULE (PG). Nutrition and toxicological evaluation of 'black tip' rice. *J. Sci. Food Agric.* 33(1); 1982; 41-7
In black tipped rice, the contents of iron and free sugar were found to be higher. A positive correlation between the extent of discolouration of the grains and the glucosamine content was observed. Species of *Alternaria* and *Curvularia* were found to be more predominant in black tip raw rice than normal raw rice. Acute toxicity studies in chicks and ducklings and short term toxicity studies in rats did not indicate ill effects. KAR
- 2674 ILAG (LL) and JULIANO (BO). Colonisation and aflatoxin formation by *Aspergillus* spp. on brown rices differing in endosperm properties. *J. Sci. Food Agric.* 33(1); 1982; 97-102
Aspergillus flavus Link and *A. parasiticus* Speare differed in sporulation and aflatoxin B₁ formation on 15 brown rices differing in starch properties and protein content. There was no significant correlation between the degree of spore formation by the fungi and the amount of aflatoxin they produced in the rice samples. Differences in sporulation and aflatoxin production were not correlated with the dimensions (weight and hardness) of brown rice nor with the protein content, alkali spreading value, amylose content and gel viscosity of milled rice. Aflatoxin B₁ was mainly

concentrated in the bran layers. Histological examination revealed that the hyphae of *A. flavus* entered through cracks in the periderm and penetrated the endosperm. AA

WHEAT

- 2675 YAMAZAKI (WT) and ANDREWS (LC). Small-scale milling to estimate the milling quality of soft wheat cultivars and breeding lines. *Cereal Chem.* 59(4); 1982; 270-72
- 2676 KILBORN (RH), BLACK (HC), DEXTER (JE) and MARTIN (DG). Energy consumption during flour milling: Description of two measuring systems and the influence of wheat hardness on energy requirements. *Cereal Chem.* 59(4); 1982; 284-8
Two instruments are described, one that employs a strain gauge transducer with instrumentation to measure energy requirements during milling for any selected roll stand in the Grain Research Laboratory (GRL) pilot mill, and another that employs a watt transducer to measure energy requirements for the roll stands in either the GRL 6-in or GRL 10-in, laboratory experimental mill. Reproducibility of both instruments was excellent. Both instruments were sufficiently sensitive to detect relatively subtle differences within a series of hard red spring wheats of varying protein content and quality. When compared to results for break flour release and flour starch damage, the energy readings gave an accurate estimate of kernel hardness. AA
- 2677 AHUJA (SS) and PATHAK (BS). Effects of various operational parameters on a mechanical separation system for wheat grain. *J. Agric. Eng.* 19(4); 1982; 57-62
- 2678 MEREDITH (P). Large and small starch granules in wheat - Are they really different? *Starch.* 33(2); 1981; 40-4
- 2679 GHIASI (K), HOSENEY (RC) and VARRIANO-MARSTON (E). Gelatinization of wheat starch. III. Comparison by differential scanning calorimetry and light microscopy. *Cereal Chem.* 59(4); 1982; 258-62
- 2680 GHIASI (K), VARRIANO-MARSTON (E) and HOSENEY (RC). Gelatinization of wheat starch. IV. Amylograph viscosity. *Cereal Chem.* 59(4); 1982; 262-5
- 2681 NICOLAS (J), AUTRAN (M) and DRAPRON (R). Purification and some properties of wheat germ lipoxxygenase. *J. Sci. Food Agric.* 33(4); 1982; 365-72
- 2682 SCHOFIELD (JD) and BAIANU (IC). Solid-state, cross-polarization magic-angle spinning carbon-13 nuclear magnetic resonance and biochemical characterization of wheat proteins. *Cereal Chem.* 59(4); 1982; 240-45
- 2683 BAIANU (IC), JOHNSON (LF) and WADDELL (DK). High-resolution proton, carbon-13 and nitrogen-15 nuclear magnetic resonance studies of wheat proteins at high magnetic fields: Spectral assignments, changes with concentration and heating treatments of flinor gliadins in solution - Comparison with gluten spectra. *J. Sci. Food Agric.* 33(4); 1982; 373-83

- 2684 KHALIL KHAN. Polyacrylamide gel electrophoresis of wheat gluten proteins. *Baker's Dig.* 56(5); 1982; 14-9
The first part of this article will deal with the PAGE procedure and how it is utilized for variety identification. The second part pertains to other uses and potential uses of PAGE in wheat research. KAR
- 2685 D'APPOLONIA (BL), MacARTHUR (LA), PISESOOKBUNTERNG (W) and CIACCO (CF). Comparison of the grain amylase analyzer with the amylograph and falling number methods. *Cereal Chem.* 59(4); 1982; 254-7
The Perkin-Elmer model 191 grain amylase analyzer was used to analyze five different series of samples, and the results were compared to falling number and amylograph peak viscosity values. One sample series contained a sound sample of wheat flour to which various amounts of barley malt were added. Two series each of wheat samples grown during the 1979 and 1980 crop years were used. The 1979 crop material contained very little sprouted wheat, whereas the 1980 crop samples showed a wide range in sprouting. Highly significant correlations were found between grain amylase analyzer results and falling number or amylograph peak viscosity values. The correlation coefficient values were highest with those samples having a wide range in amylase activity. AA
- 2686 DOEKES (GJ) and WENNEKES (LMJ). Effect of nitrogen fertilization on quantity and composition of wheat flour protein. *Cereal Chem.* 59(4); 1982; 276-8
- 2687 HAMADA (AS), McDONALD (CE) and SIBBITT (LD). Relationship of protein fractions of spring wheat flour to baking quality. *Cereal Chem.* 59(4); 1982; 296-301
- 2688 ARYA (SS) and PARIHAR (DB). Effect of moisture and temperature on storage changes in lipids and carotenoids of atta (wheat flour). *Nahrung.* 25(2); 1981; 121-6
Effect of moisture and temperature on changes in total carotenoids, fat acidity, free and bound lipids and their composition, taking place during storage of atta are reported. At moisture contents of 10.4% and below, increase in fat acidity results mainly from hydrolysis of neutral lipids; phospho- and galactolipids are not hydrolyzed to a significant extent. At moisture level of 11.6% and above both phospho- and galactolipids are degraded to a significant extent. At moisture levels of 12.9% and above mould growth ensues which greatly accelerates the rate of degradation of both polar and nonpolar lipids. Degradation of carotenoids also increases with increase in storage temperature and moisture content from 9.4 to 16%. AA
- 2689 SPROSSLER (B). Effect of proteases in wheat flour. *Getriede-Mehl Brot.* 35(3); 1981; 60-2 (German)
Though proteases are already present in flour, the use of exogenous proteases - of bacterial, fungal, or plant origin - can help in the production of baked goods. Fungal proteases are very suitable for addition to strong, bread or roll flours, because of their wide dose tolerance and mild gluten modification. Bacterial proteases and papain decompose the protein to a greater extent, and are suitable for the production of cakes, biscuits, and waffles. KMD

- 2690 ELISARIO (MA), BUONOCORE (V), CANTARELLA (M), SCARDI (V) and SILANO (V). Inhibition of α -amylase purified from *Octopus vulgaris* Lam. by albumin inhibitors from wheat flour. *Qualitas plantarum*. 31(1); 1981; 21-30
- 2691 DANNO (G) and HOSENEY (RC). Changes in flour proteins during dough mixing. *Cereal Chem.* 59(4); 1982; 249-53
- 2692 BOTTOMLEY (RC), KEARNS (HF) and SCHOFIELD (JD). Characterisation of wheat flour and gluten proteins using buffers containing sodium dodecyl sulphate. *J. Sci. Food Agric.* 33(5); 1982; 481-91
- 2693 MANSER (J). Optimal parameters for pasta production, especially long goods. *Getreide-Mehl Brot.* 35(3); 1981; 75-83

MILLETS

- 2694 CHANDRASHEKHAR (G), RAJU (DS) and PATTABIRAMAN (TN). Natural plant enzyme inhibitors, protease inhibitors in millets. *J. Sci. Food Agric.* 33(5); 1982; 447-50

Proso (*Panicum miliaceum*), miliare (*Panicum miliare*) and Kodo (*Paspalum scrobiculatum*) millets showed only antitryptic activity. Ragi (*Eleusine coracana*) had both antitryptic and antichymotryptic activity. Two varieties of sorghum had neither antitryptic nor antichymotryptic activity. In most other strains of sorghum, the antichymotryptic activity was more than the antitryptic activity. KAR

MAIZE

- 2695 VanCAUWENBERGE (JE), BOTHAST (RJ) and BLACK (LT). Fermentability of high-moisture corn treated with chemical preservatives. *J. Agric. Food Chem.* 30(4); 1982; 752-4
- 2696 KOUSHDI (M), GHALI (Y) and HASSANEAN (A). Factors improving the steeping process of corn grains. Part III. Conditions favouring lactic acid formation during corn steeping and its effect. *Starch.* 33(2); 1981; 49-52
- Conditions affecting lactic acid formation were studied. Intact, scratched and presteeped corn grains were used in presence of fresh and nonfresh SO₂ solution of different concentrations. It was found that low concentrations of nonfresh SO₂ solution favour lactic acid formation. But, low concentrations of fresh SO₂ solution and presteeped corn grains gave a higher quantity of lactic acid. Using a high concentration of SO₂ solution, which inhibits lactic acid formation, gave the highest yield of starch with the lowest protein content in the extracted starch. AA
- 2697 CEH (M), STROPNIK (C), DOLECEK (V) and LESKOVAR (S). Stepwise elution analysis of thermally dispersed amylose and waxy corn starch. *Starch.* 33(2); 1981; 45-9 (German)
- Changes of native amylose and waxy corn starch during thermic dispersion were observed by elution analysis. Gelatinization of starch was carried out in the Brabender viscograph. The pastes were thermally dispersed and treated with NaOH solution. By stepwise elution, it was found out that disaggregation of starch kernels and decomposition of the molecules from

waxy corn starch proceed more intensively than those from amylase starch. Additional dispersing of amylase starch in NaOH solution causes a disaggregation of the amylose. The experiments confirm earlier results showing a decrease in molecular weights with increasing dispersion in an autoclave. AA

- 2698 PLAHAR (WA) and LEUNG (HK). Effect of moisture content on the development of carboxylic acids in traditional maize dough fermentation. *J. Sci. Food Agric.* 33(6); 1982; 555-8

Maize dough samples containing 45, 52, 65 and 80% initial moisture were fermented over a 3 day period, and the rate of development of carboxylic acids was determined. The desired volatile:non-volatile acids ratio of 0.16, titratable acidity of 2.4 mg NaOH g⁻¹ sample, and pH of 3.7 could be achieved with only the 52% moisture samples. A slow rate of acid production and an early onset of mould growth was observed in samples with 45% moisture. The 65 and 80% moisture samples developed high concentrations of acids with resultant high degree of sourness. Acetic, propionic and butyric acids were the major volatile acids in samples with moisture contents over 52%. AA

- 2699 LARKINS (BA), MASON (AC) and HURKMAN (WJ). Molecular mechanisms regulating the synthesis of storage proteins in maize endosperm. *CRC Crit. Rev. Food Sci. Nutr.* 16(2); 1982; 199-215

- 2700 ECKHOFF (SR), BLACK (LT) and ANDERSON (RA). Predicting the moisture isotherm for corn-soy milk from individual component moisture isotherms and their possible effects on storage stability. *Cereal Chem.* 59(4); 1982; 289-90

Moisture isotherms for the blended food product corn-soy milk (CSM) and for the individual hygroscopic constituents of CSM are reported at 25 C. Isotherms were used to predict the moisture content of each constituent after blendings by applying a procedure previously developed for dehydrated food. Nonfat dry milk in CSM formula 2 increases in moisture content from 4.0 to 8.2% because of the moisture transfer from the soy flour, which decreased from 10.0 to 8.9% moisture. AA

- 2701 CHAKRABARTI (AG). Detoxification of corn. *J. Food Prot.* 44(8); 1981; 591-2

Samples of corn (maize) contaminated with aflatoxins were ground by a Wiley mill, using a 40-mesh sieve to make meal. This treatment reduced the toxin level to less than 20 ppb. Detoxification was done by separate treatments of 3% H₂O₂, 75% methanol, and 5% dimethylamine hydrochloride or 3% perchloric acid. The loss in fresh weight due to these treatments was 28, 14, 7, and 7% respectively. Loss in proteins and lipids due to the detoxification processes did not exceed 0.5 to 0.6% respectively, when compared with the fresh weight of corn. KMD

- 2702 KHAN (MN), DesROSIERS (MC), ROONEY (LW), MORGAN (RG) and SWEAT (VE). Corn tortillas: Evaluation of corn cooking procedures. *Cereal Chem.* 59(4); 1982; 279-84

- 2703 GARCIA-LOPEZ (S) and WYATT (CJ). Effect of fiber in corn tortillas and cooked beans on iron availability. *J. Agric. Food Chem.* 30(4); 1982; 724-7

Availability of iron from a diet of corn tortillas and cooked beans

with different levels of fiber was determined by hemoglobin repletion. Neutral detergent fiber (NDF) in corn tortillas and cooked beans and soluble, ionizable, and total iron in the test foods were determined. Weanling male rats were fed an iron-free diet until anemic and then divided into groups. The rats were fed diets with 6.5, 10, and 15% NDF and 25, 30, and 35 ppm of total iron. Iron availability was significantly reduced by 15% NDF. The amount of iron in the diet affected iron repletion. A significant correlation between soluble iron at pH 1.35 in vitro and percent efficiency of hemoglobin repletion was obtained. Iron from corn tortillas and cooked beans is approximately 50% less available than ferrous sulphate. AA

- 2704 KIRKPATRICK (RL), REDLINGER (LM), ZETTLER (JL) and SIMONAITIS (RA). CGA-20168 applied to corn for control of stored-product insects. *J. Econ. Entomol.* 75(2); 1982; 277-80

CGA-20168 (methyl 3-((dimethoxyphosphinothioyl)oxy)-2-methyl-2-propenoate) was applied on corn as emulsion sprays to determine the stability of residues and to assess its ability to control infestations of stored-product insects during a 1-year storage period at ambient temperatures. Although CGA-20168 residues decreased significantly during storage, protection from infestation by stored-product insects was provided throughout the storage period. AA

BARLEY

- 2705 CHANG (H-G) and MARKAKIS (P). Effect of gamma irradiation on aflatoxin production in barley. *J. Sci. Food Agric.* 33(6); 1982; 559-64

Barley was inoculated with conidia of *Aspergillus parasiticus* NRRL 2999, and at 0 C was left to equilibrate at three moisture levels: 17, 20 and 25%. Gamma irradiation at five doses, 0, 50, 100, 200 and 400 krad, was applied to the grain either soon after moisture equilibration (3 days after inoculation) or 10 days later (13 days after inoculation). Increasing the radiation dose resulted in decreasing aflatoxin formation, with one exception: 200 krad applied 13 days after inoculation on barley stored at a moisture level of 25% (100% relative humidity) and 25 C led to higher aflatoxin production than at 100 or 50 krad. For the control of aflatoxin contamination in barley, storage at low moisture content appears to be more practical and effective than irradiation. AA

PULSES

- 2706 NARASINGA RAO (BS) and PRABHAVATHI (T). Tannin content in foods commonly consumed in India and its influence on ionisable iron. *J. Sci. Food Agric.* 33(1); 1982; 89-96

The tannin content of a number of foods and diets commonly consumed in India has been determined. Most of the tannin in legumes reside in the seed-coat. Decortication of seeds reduced tannin to a low level with a significant increase in ionisable iron. Germination of the legumes also resulted in a decrease in tannin and an increase in ionisable iron. Diets consumed in different parts of the country had tannin contents ranging from 1.5 to 2.5 g. Much of this appeared to be contributed by spices. A high level of tannin in these foods is associated with low ionisable iron.

It is suggested that besides phytates, tannin may be an important factor responsible for the low absorption of iron from habitual diets in India.
AA

- 2707 BEACHY (RN). Molecular aspects of legume seed storage protein synthesis. *CRC Crit. Rev. Food Sci. Nutr.* 16(2); 1982; 187-98 .
Discusses: rationale of the studies; storage proteins of *Pisum sativum*; storage proteins of *Phaseolus vulgaris* ; and storage proteins of *Glycine max.* BSN
- 2708 KAPUR (KL), VERMA (RA), TRIPATHI (MP) and SRIVASTAVA (BP). Preliminary studies on screening of pea varieties for dehydration. *Prog. Hortic.* 13(2); 1981; 37-45
Out of the 27 cultivars studied for their suitability for dehydration, Banaras, Sweet, Madhu, K.S. 119, K.S. 114, K.S. 112 and K.S. 126 which lacked cuticle and possessed exceptionally wider pods and low yielders, were not suitable for dehydration. Varieties G.C. 477, 6415 and GC 141 appeared to be more promising as they had higher TSS, dehydration and reconstitution ratios and scored higher in organoleptic evaluation. KAR
- 2709 TAYLOR (AJ) and PRITCHARD (S). The potential of peapods as food thickeners. *J. Sci. Food Agric.* 33(4); 1982; 384-8
De-esterified peapods containing low methoxyl pectin was incorporated into canned minced-beef product in the presence of calcium ions. KAR
- 2710 GONZALEZ (AR), EDWARDS (KM) and MARX (DB). Storage and processing quality of beans (*Phaseolus vulgaris*) harvested at the semi-dry stage. *J. Am. Soc. Hortic. Sci.* 107(1); 1982; 82-86
The processing quality (for canning) of kidney, pinto and small white beans was compared when harvested at the dry (11-14% moisture) and semi-dry (50-60% moisture) stage. KAR
- 2711 FERNANDEZ (R), ELIAS (LG), BRAHAM (JE) and BRESSANI (R). Trypsin inhibitors and hemagglutinins in beans (*Phaseolus vulgaris*) and their relationship with the content of tannins and associated polyphenols. *J. Agric. Food Chem.* 30(4); 1982; 734-9
- 2712 REDDY (NR), SATHE (SK), PIERSON (MD) and SALUNKHE (DK). Idli, an Indian fermented food: A review. *J. Food Quality.* 5(2); 1981; 89-101
Review covers preparation, physico-chemical and microbiological changes and organoleptic characteristics; nutritional composition and quality; antinutritional factors; and preparation of idli from legumes other than black gram. KAR

BLACK GRAM

- 2713 REDDY (NR), SALUNKHE (DK) and SATHE (SK). Biochemistry of black gram (*Phaseolus mungo* L): A review. *CRC Crit. Rev. Food Sci. Nutr.* 16(1); 1982; 49-114
Discusses: proteins; minerals and phytic acid; carbohydrates and their digestibility; toxic proteins and tannins; lipids; vitamins; and food uses. BSN

- 2714 CHAVAN (JK) and DJURTOFT (R). Purification and characterisation of seed globulins from black gram (*Phaseolus mungo*). *J. Sci. Food Agric.* 33(5); 1982; 471-80

The major-globulins of black gram have been purified by anion exchange chromatography followed by gel filtration. Then the most appropriate fractions were identified by fused rocket immunoelectrophoresis using antisera prepared against black gram proteins. Also describes some applications of immunochemical methods as very sensitive and useful techniques for the purification of storage proteins. KAR

FABABEAN

- 2715 HEGAZY (MI) and MARQUARDT (RR). Development of a simple procedure for the complete extraction of vicine and convicine from fababeans (*Vicia faba* L.). *J. Sci. Food Agric.* 34(1); 1983; 100-108

In this experiment, vicine and convicine were almost completely removed from whole or dehulled fababeans when they were extracted at 20 or 40 C with 1% glacial acetic acid or water over a 72 hour period with changes in the extracting media every 24 hour. KAR

GREEN BEAN

- 2716 BOYD (JN), MISSLBECK (N) and STOEWESAND (GS). Changes in preneoplastic response to aflatoxin B₁ in rats fed green beans, beets or squash. *Food Chem. Toxicol.* 21(1); 1983; 37-40

Rats were fed diets containing 25% freeze dried green beans, beets or squash either with or without 1 ppm aflatoxin B₁ for 8 weeks. All three vegetable diets, as compared to the basal semi-purified diet, enhanced both aflatoxin-B₁-induced elevation of plasma α -foetoprotein and aflatoxin -B₁-induced emergence of hepatic cell foci or γ -glutamyl transpeptidase. The data suggest that these vegetables contain natural factors that enhance aflatoxin B₁ carcinogenicity. AA

GUAR

- 2717 KAUSHAL (GP) and BHATIA (IS). A study of polyphenols in the seeds and leaves of guar (*Cyamopsis tetragonoloba* L. Taub). *J. Sci. Food Agric.* 33(5); 1982; 461-70

Gallotannins, gallic acid, gallic acid derivatives, myricetin-7-glucoside-3-glycoside, kaempferol-7-glucoside-3-glycoside, kaempferol-3-rutinoside, kaempferol-3-glucoside, chlorogenic acid, caffeic acid, and ellagic acid were derived from guar seeds and identified by chromatographic and spectral analysis. The polyphenolic content depended on the stage of maturity varying from 1.26 to 0.69% total phenols; 0.49 to 0.12% gallic acid, 0.5 to 0.21% gallotannins, and 0.13 to 0.23% flavonols (all as % DM). KAR

HORSEGRAM

- 2718 SATWADHAR (PN), KADAM (SS) and SALUNKHE (DK). Effects of germination and cooking on polyphenols and *in vitro* protein digestibility of horsegram and moth bean. *Qualitas plantarum*. 31(1); 1981; 71-6

Germination had very little effect on crude protein content. In the ungerminated form, horsegram proteins had better digestibility than moth bean proteins. The *in vitro* protein digestibility increased during germination in both the legumes. Polyphenol content in horsegram decreased from 1.6% to 1.1% at 48 hours after germination; but in moth bean there was a reduction in polyphenol content from 1.3% to 1.0% at 24 hours after germination with a significant increase from 1.0% to 1.7% at 36 hours after germination. VR

NAVY BEAN

- 2719 DeFOUW (C), ZABIK (ME), UEBERSAX (MA), AGUILERA (JM) and LUSAS (E). Effects of heat treatment and level of navy bean hulls in sugar-snap cookies. *Cereal Chem.* 59(4); 1982; 245-8
- 2720 DRYER (SB), PHILLIPS (SG), POWELL (TS), UEBERSAX (MA) and ZABIK (ME). Dry roasted navy bean flour incorporation in a quick bread. *Cereal Chem.* 59(4); 1982; 319-20

WINGED BEAN

- 2721 DENCH (JE). Extraction of nitrogenous material from winged bean (*Psophocarpus tetragonolobus* (L.) DC) flour and the preparation and properties of protein isolates. *J. Sci. Food Agric.* 33(2); 1982; 173-84

The extractability of nitrogenous material from the seeds of 12 winged bean accessions has been investigated. Little variation in nitrogen content and extractability in water or salt solution was obtained, although decortication considerably reduced the levels of extraction. The effect of three oil extraction procedures on the extractability of nitrogenous material at different pH values is reported. Protein isolates were prepared and simple laboratory tests were used to evaluate their functional properties. The prepared winged bean isolates possessed very low bulk densities and high fat absorption values and the relationship between these factors was investigated further. Winged bean isolates showed high (100%) nitrogen dispersibilities and were able to form heat-stable emulsions. They did not form gels under the conditions used except in the presence of CaCl_2 . Isolates prepared from unheated winged bean flour formed stiff but unstable foams. The relationship between the oil extraction procedure and isolate yield, purity and functional properties is discussed. AA

OILSEEDS AND NUTS

- 2722 PATEL (SM). Indian vegetable oil industry. *Indian Food Ind.* 1(1&2); 1982; 19-31

Discusses: nutritional importance; sources of oils and fats; increasing production of oilseeds and oils; palm oil; postharvest technology;

causes of oilseed deterioration; present practices; development of oil and fat industry; oilseeds milling industry; solvent extraction industry; oil refining and vanaspati industry; blending of oils; R & D efforts and future scope; and by products. BSN

- 2723 RAFAT HUSAIN (S), SHAMIM AHMAD (M), AHMAD (SM), AHMAD (M) and OSMAN (SM). Studies on herbaceous seed oils - XIII. *J. Oil Technol. Assoc. India.* 14(2); 1982; 61-3

Seeds of nine species of plants (*Semecarpus anacardium*, *Jatropha gossypifolia*, *Hygrophyla polysperma*, *Polyalthia longifolia*, *Calystegia hederacea*, *Bridelia montana*, *Ageratum conyzoides*, *Glochidion velutinum* and *Lagerstroemia parviflora*) were analyzed for oil and protein contents. Oil from all the species, except *Jatropha gossypifolia*, had a high (45.6-92.0%) content of C_{18} - unsaturated acids. The oil of *J. gossypifolia* contained 73.8% of saturated fatty acids, including 31.4% of palmitic acid. Moreover, *Jatropha* seeds contain about 28.4% oil; hence, this species can be considered as a potential crop for the production of an oil resembling palm oil. There is also some chance of *Jatropha* oil being used as a substitute for cocoa butter. KMD

- 2724 SHERWANI (MRK), SIDDIQUI (SF), AHMAD (I), HASAN (SQ) and OSMAN (SM). Studies on leguminosae seed oils. *J. Oil Technol. Assoc. India.* 14(2); 1982; 66-7

The seed oils of seven, herbaceous Leguminosae (*Trigonella corniculata*, *Bauhinia malabarica*, *Atylosia scarabacoides*, *Indigofera trita*, *I. linifolia*, *Cyamopsis psoralioides* and *Cassia sophera*) were analyzed by GLC. All these oils proved to be of the linoleic-oleic-palmitic type, like most of the other legume-seed oils. Linolenic acid is present in small amounts in the oils of all these species, except in *Bauhinia malabarica*. The oil of *B. malabarica* resembles cottonseed oil in composition, and that of *I. trita* resembles soyabean oil. KMD

- 2725 KITTUR (MH), MAHAJANSHETTI (CS), RAO (KUSA) and LAKSHMINARAYANA (G). Characteristics and composition of *Abutilon pannosum* and *Hibiscus panduriformis* seeds and oils. *J. Am. Oil Chem. Soc.* 59(3); 1982; 123-4

The seeds of *Abutilon pannosum* (Forst.) Schlecht., syn, *A. muticum* (DC.) Sweet, and *Hibiscus panduriformis* Burm. (Malvaceae), respectively, contained 13.4 and 15.4% oil, and 23.0 and 22.2% protein. The respective seed oil had iodine values of 118.4 and 132.4, and saponification values of 194.3 and 188.8. The fatty acid composition (weight %), as determined by gas liquid chromatography, was: palmitic, 21.3, 12.3; stearic, 2.8, 3.2; oleic, 11.7, 10.2; linoleic, 60.7, 74.3; malvalic, 2.2, trace; sterculic, trace, none; and dihydrosterculic, 1.3, none, respectively. AA

CASTOR OIL

- 2726 ADHIKARI (S) and ADHIKARI (DJ). Detection of castor oil. *J. Oil Technol. Assoc. India.* 14(2); 1982; 57-8

TLC of the alcohol extract, or after methanolysis, affords a simple and quick method for detecting the adulteration of other vegetable oils with castor oil. Conversely, trace amounts of other vegetable oils in castor oil can also be detected by TLC, using methanol/acetic acid as the developing solvent. KMD

RAPESEED

- 2727 SZUKALSKA (E) and DROZDOWSKI (B). Selective hydrogenation of rapeseed oils with copper-chromite catalyst: Influence of erucic acid. *J. Am. oil. Chem. Soc.* 59(3); 1982; 134-9

Rapeseed oils with different erucic acid contents have been hydrogenated in a "dead-end" type of laboratory reactor with Adkins-type copper-chromite catalyst. It was observed that, as is true with oleic acid, erucic acid is not hydrogenated by this catalyst, but it differs in that positional or geometrical isomerization does not occur. The presence of erucic acid does not change the mechanism of hydrogenation of rapeseed oils in a range of concentrations of this acid. On the other hand, it markedly influences the rate of reaction. AA

- 2728 ARNHOLDT (B) and SCHUSTER (W). Variability of crude protein and crude fat content of rapeseed influenced by environment and genotype. *Fette Seifen Anstrichmittel.* 83(2); 1981; 49-54 (German)

A great number of genotypes of rape from different locations and several years were investigated. There appeared a genotypic variability of crude protein and crude fat content in seed as well as of the sum of both. All the three characteristics were clearly more influenced by environment than by genotype. The phenotypic correlation of crude protein and crude fat is negative for the whole material. The coefficients of winter rape were between $r = -0.722$ and $r = -0.853$ and of summer rape between $r = -0.616$ and $r = -0.945$. Heritability values of winter rape calculated by means of components of variance were 0.26 for crude protein, 0.29 for crude fat and 0.20 for the amount of both. AA

- 2729 WATTERS (FL) and NOWICKI (TW). Uptake of bromophos by stored rapeseed. *J. Econ. Entomol.* 75(2); 1982; 261-4

Field studies showed that 11.3 metric tons of rapeseed stored in a plywood-lined granary treated with bromophos at 0.5 g of Al/m² had residues of 0.1 to 2.6 ppm after 16 weeks and 0.4 to 3.5 ppm after a further 236 weeks of storage. The residues exceeded the Food and Agriculture Organization/World Health Organization tolerance limit of 0.2 ppm of bromophos recommended for rapeseed. Laboratory studies of insecticide uptake by rapeseed or wheat from wood or concrete surfaces treated with bromophos EC or malathion EC at 0.5 g of Al/m² showed that uptake was higher in rapeseed than in wheat ($P < 0.01$); bromophos uptake from treated wood surfaces into rapeseed or wheat was greater than that of malathion ($P < 0.01$); and uptake of both insecticides by rapeseed or wheat was greater from treated wood than concrete. AA

SAFFLOWER

- 2730 LYON (CK), KOHLER (GO) and HANNAMOTO (MM). Lipid-protein complexes from safflower expeller cake. *J. Am. Oil Chem. Soc.* 59(3); 1982; 119-22

Lipid-protein complexes were prepared from safflower prepress expeller cake, which contains about 18% oil and 17% protein, by grinding and extraction with aqueous alkali, then coprecipitation of oil and protein in the extract with acid. In the laboratory, using hammer mills or high-shear homogenizers, complexes were obtained containing up to 48% oil with 46% protein. In the pilot plant, the best extraction, using an attrition

mill, yielded a complex containing 44% oil and 47% protein. Phenolic glucosides, which contribute to the bitterness and cathartic activity, in safflower meal, were removed during the process. Loaves of bread with 10% of the wheat flour replaced by safflower lipid-protein complexes had acceptable properties and contained 25-36% more protein than the controls. AA

SOYABEAN

- 2731 PARDUN (H). Stabilizing of soyabean oil by citric acid treatment. *Fette. Seifen Anstrichmittel*. 83(2); 1981; 76-8
The proposal of Julius D. Tanssky to add small amounts of citric acid to the neutralized and bleached oil at the beginning of deodorisation turned out to be a very effective agent in the production of oils stable in taste. The submitted report deals with the still historical development of the Tanssky-process. AA
- 2732 SIMONS (RG). Separation of salt from soyabean hydrolysates by electro-dialysis. *Food Technol. Aust.* 34(6); 1982; 294-5
The results demonstrate that soyabean hydrolysates and amino acid mixtures may be desalted by electrodialysis. The preliminary experiments should be redicible by a more appropriate choice of operating currents. KAR
- 2733 FRIEDMAN (M), GROSJEAN (OKK) and ZAHNLEY (JC). Inactivation of soyabean trypsin inhibitors by thiols. *J. Sci. Food Agric.* 33(2); 1982; 165-72
Systematic studies of factors that inactivate soyabean trypsin inhibitors showed that thiols facilitate heat inactivation. Heating soyaflour in an aqueous medium in water-bath from 25 to 93 C for 1 hour showed that heat alone does not begin to inactivate the inhibitor until about 55 C. The corresponding value at 85 C is 60%. In contrast, inactivation in the presence of N-acetylcysteine proceeds more rapidly as shown by 70% inactivation at 55 C and 94% at 85 C. KAR
- 2734 LIPPI (MS) and TARANTO (MV). Soy protein - Acidic polysaccharide interaction: Modification of the emulsification properties of soy protein isolate. *Food Sci. + Technol.* 14(2); 1981; 55-9
The effect of interacting soy protein isolates with sodium alginate under specified reaction conditions on the pH 7 emulsification activity and stability of the protein was evaluated. Interacting the proteins with alginate in a 4:1 protein : alginate ratio yielded a complex which exhibited an improved emulsification activity and stability compared to control samples. An interaction ratio of 10:1 (protein : alginate) did not alter the emulsification properties compared to the control samples. The 4:1 protein to alginate complexes exhibited emulsification activities and stabilities which were comparable to those of egg yolk tested under similar conditions. AA
- 2735 JHAM (GN), TELES (FFF) and CAMPOS (LG). Use of aqueous HCl/MeOH as esterification reagent for analysis of fatty acids derived from soyabean lipids. *J. Am. Oil Chem. Soc.* 59(3); 1982; 132-3
A quick, reliable and very inexpensive method is described for the analysis of fatty acids derived from soyabean lipids. The method involves extraction of soyabean lipids with petroleum ether, followed by hydrolysis of lipids with KOH/MeOH (0.5 M) for 5 minutes at 100 C followed by

esterification with aq. HCl (36%)/MeOH (4:1, v/v) for 15 minutes at 100 C. No problems were encountered with the esterification procedure in the presence of water and the procedure gave results comparable to the more conventional BF₃/MeOH reagent. The aq. HCl/MeOH reagent is several hundred times cheaper than BF₃/MeOH, and does not compromise the efficiency of the reagent. AA

- 2736 HILDEBRAND (DF) and HYMOWITZ (T). Carotene and chlorophyll bleaching by soyabeans with and without seed lipoxygenase-1. *J. Agric. Food Chem.* 30(4); 1982; 705-8
- 2737 JASBERG (BK), MUSTAKAS (GC) and BAGLEY (EB). Effect of extruder retention time of capillary flow of soy dough. *J. Food Process. Eng.* 5(1); 1982; 43-56

Soy dough (defatted soy flakes), at 120 C and 30% moisture, was extruded through a series of dies of differing length (L) and radius (R). Plots of pressure (P) were linear with the length to radius ratios (L/R) of the dies at constant output rate (Q) and R. The intercepts of the P versus (L/R) plots on the P = 0 axis give the end corrections (e) for capillary flow at each output rate. For soy dough, these end corrections were surprisingly large at low output rates and generally decreased rapidly with increasing output rate. This is contrary to the normal behaviour of viscoelastic fluids, such as thermoplastics, where the end correction increases with increasing output rate. Both the end correction, which is a measure of the elastic properties of the soy dough, and the viscosity of the soy dough depended on the output rate as expected and also on the retention time of the material in the system. AA

SUNFLOWER

- 2738 PEERS (KE) and SWOBODA (PAT). Deterioration of sunflower seed oil under simulated frying conditions and during small-scale frying of potato chips. *J. Sci. Food Agric.* 33(4); 1982; 389-95

The changes occurring in sunflower seed oil under simulated frying conditions and during potato chip frying were monitored. The changes monitored were in: (a) fatty acid composition, (b) triglyceride content, (c) octanoate content, (d) titratable acidity, and (e) colour. To simulate frying conditions either argon or air, with or without steam, was bubbled through the hot oil. For the frying of potato chips, two methods of frying were used, viz. continuous frying throughout 1 day and intermittent frying over a total of 10 days. It was found that whenever the hot oil was exposed to air, whether during simulated frying or the frying of potato chips, there was evidence of oxidative deterioration. Steam appeared to have an antioxidant effect in the simulated frying experiments. In all experiments the molar yield of acidity was comparable in magnitude with that of the octanoate. The correlation of octanoate production with the losses of linoleate and triglyceride is discussed. AA

- 2739 DIEHL (JF) and KIM (Ch). Formation of vitamin E-destroying substances during aerobic storage of electron-irradiated or heated sunflower oil. *Food Sci. + Technol.* 14(2); 1981; 82-5

Carbonyl content, peroxide value, thiobarbituric acid number and tocopherol destroying substances (X) were determined in electron-irradiated, heated and untreated sunflower oil during aerobic storage for up to

30 days, Irradiation produces precursors (pre-X), probably aldehydes, which are converted to X, probably peroxides, when exposed to air, Pre-X and X are water-soluble and can be extracted from the oil. Amino acids added to the aqueous extract protect tocopherol against destruction. Kinetics of formation and disappearance of pre-X and X in irradiated oil are different from kinetics observed in heated oil. AA

ALMOND

- 2740 CALIXTO (FS) and CANELLAS (J). Chemical composition of hulls of the sweet almond (*Prunus amygdalus*). *J. Sci. Food Agric.* 33(4); 1982; 336-9
- 2741 PAYNE (W). Use of almonds in confections. *Manuf. Confect.* 61(10); 1981; 37-41

COCONUT

- 2742 HAGENMAIER (R). Aqueous processing of coconuts. *Oleagineux.* 36(3); 1981; 145-146 (French)
- Aqueous processing of coconuts has developed to a stage where six, coconut food items of high quality can be produced; viz. coconut oil, skim milk powder, protein, dried coconut milk, pressed meat, and coconut flour, all of which are described. The yield of liquid oil is 95% of the theoretical maximum. KMD
- 2743 JASWANT SINGH; NAMBIAR (KK) and NAMBIAR (CKB). Design, development and testing of a batch type solar copra dryer. *J. Agric. Eng.* 19(3); 1982; 99-106
- Solar copra dryer for capacity of 150 coconuts per batch was designed developed and tested. It saved 44% of total drying time, in bringing down the moisture content of Kernel from 53.10% (w.b.) to 6.2% (w.b.), compared to open yard drying. The drying cost per 100 nuts was Rs. 3.45 for solar dryer as against Rs. 6.67 for open drying. AA
- 2744 HEAD (SW). A simple method for the determination of residual oil in coconut poonac. *Trop. Sci.* 23(3); 1981; 227-34
- A simple method for the determination of residual oil in coconut poonac (copra presscake) is described which is particularly suitable for production control in medium-scale oil mills in developing countries. The major item of equipment required is an infra-red moisture balance. Results are within ± 10 per cent of those given by the Soxhlet method. The method could be applicable to other oil bearing materials provided that only approximate results are required. AA
- 2745 ZETTLER (JL). Insecticide resistance in selected stored-product insects infesting peanuts in the Southeastern United States. *J. Econ. Entomol.* 75(2); 1982; 359-62

GROUNDNUT

- 2746 SEMPORE (G) and BEZARD (J). Triacylglycerol structure of an African peanut oil. *J. Am. Oil Chem. Soc.* 59(3); 1982; 124-9

- 2747 NASIRULLAH, ANKAIAH (KN), KRISHNAMURTHY (MN), NAGARAJA (KV) and KAPUR (OP). Storage study on groundnut oil. *J. Oil Technol. Assoc. India.* 14(2); 1982; 55-6

The physico-chemical characteristics and fatty acid composition of groundnut oil stored in amber-coloured bottles for 18 months at room temperature were determined at monthly intervals. The iodine value dropped from 95 to 92, and the saponification value dropped from 194.7 to 189.7. BR readings and Bellier value remained constant. The linoleic acid content decreased from 33 to 31%. KMD

MACADAMIA

- 2748 MACFARLANE (N) and HARRIS (RV). Extraction of macadamia oil using a small expeller. *Trop. Sci.* 23(3); 1981; 205-15

Traditional sorting and grading procedures for confectionery macadamia nuts in Malawi reject approximately 25 per cent of the crop. Investigations have been carried out, initially in the UK and subsequently in Malawi, on the feasibility of using these reject nuts as a source of edible oil. The nuts were found to have an overall oil content of 60 per cent and a high proportion of this oil could be readily extracted using a small screw expeller. The oil was of sufficient quality not to need further processing other than settling and has been used for frying confectionery grade nuts as a replacement for the costly imported coconut oil used in the past. The oil can also be used as a domestic frying oil and as a raw material for soap manufacture. Full details of the extraction techniques recommended are given. AA

SHEA BUTTER

- 2749 KAR (A) and MITAL (HC). The study of shea butter. VI. The extraction of Shea butter. *Qualitas plantarum.* 31(1); 1981; 67-9

Shea butter (Salfat) has been extracted from the seeds of the shea tree, *B. parkii*, with various organic solvents. Petroleum ether (40-60 C), n-hexane, chloroform and benzene extracted 32-38% of fat and 8-9 mg% of vitamin E. These solvents, particularly petroleum ether and n-hexane, can be used for the production of shea butter free from any oxidized fat and coloured impurities. AA

- 2750 ANON. Shea butter - an effective material of the traditional African medicine. *Riechstoffs Aromen Kosmet.* 31(8); 1981; 265 (German)

This article on shea butter (sal. fat) illustrates the healing properties of unsaponifiable matter in it, soothing effect and excellent cutaneous compatibility. VR

TUBERS AND VEGETABLES

- 2751 BRATZ (J) and QUENDT (H). Water and energy saving lay out of the precooling of whitened lumpy products. *Lebensmittelindustrie.* 28(1); 1981; 14-7 (German)

For precooling of lumpy whitened vegetables in the VEB "Elbtal" Lommatzsch, a novel technique developed enables precooling with the help

of evaporative cooling to lower temperature of the vegetables, on an average, to 3 C below room temperature. AA

- 2752 PINAGA (F), VALLES (S) and CARBONELL (JV). Stability of prepared meals in relation to preservation processes. II. Assays with vegetable stew. *Rev. Agroquím. Tecnol. Aliment.* 21(1); 1981; 137-47 (Spanish)
Initial quality and storage stability of vegetable stew preserved by heat sterilization, freezing, pasteurization - refrigeration and freeze-drying were studied. Over all acceptance, visual appearance, off-flavours, ascorbic acid content, colour of some components, free fatty acids content and peroxide value were used as quality and stability parameters. Refrigerated, pasteurized and frozen samples showed the highest initial quality in relation to analytical parameters considered as a whole. After 90 days of storage, organoleptic scores of sterilized sample significantly exceeded those obtained by the other samples, including the frozen one. From the initial evaluation, freeze-dried samples showed the lowest quality. These samples do not reach minimum organoleptic acceptance levels and their rancidity increases rapidly in spite of the presence of antioxidants. AA
- 2753 D'ARRIGO (V). Variations of the lead content of products preserved in tinplate cans. *Ind. Aliment.* 20(182); 1981; 261-3 (Italian)
Lead content has been measured in various samples of vegetables canned in containers made of tin-plate. The results show that lead contents are always higher in canned vegetables than in uncanned vegetables. A revision of standards has been suggested. KMD
- 2754 KOSTAROPOULOS (AE). The introduction of an empirical expression in the texture studies of vegetables. *Food Sci. + Technol.* 14(2); 1981; 97-9
Asparagus and carrots were stored under various conditions, and their freshness was tested, both subjectively and by means of an empirical expression based on compression tests. The formula enables a distinction to be made between fresh and non fresh vegetables. It has been applied successfully to peas, chives, and green beans also, and may be assumed to be applicable to all "crackable" vegetables. KMD
- 2755 BUTLER (JB). An investigation into some causes of the differences of protein expressibility from leaf pulps. *J. Sci. Food Agric.* 33(6); 1982; 528-36
On a laboratory scale, changes in expressibility of protein with age from leaf pulp of lucerne, amaranth, garden orache, sunflower, fat hen, dock and field beans were not closely correlated with changes of fibrous dry matter, cell robustness, pH or tannin content. However, for amaranth, garden orache, and fat hen, a strong correlation was found between protein expressibility and the proportion of the total leaf water that was expressed. KAR

ONION

- 2756 CURZIO (OA) and CROCI (CA). Extending onion storage life by gamma-irradiation. *J. Food Process. Preserv.* 7(1); 1983; 19-23
Gamma irradiation (0.03 KGy $\pm$ 25%) effects on onions bulbs from local

cultivar were studied. The treatment proved to be effective in reducing weight loss and increasing the percentage marketable bulbs. Radiation-induced darkening in marketable irradiated bulbs had no influence on their internal structure. AA

GARLIC

- 2757 DIXIT (VP) and JOSHI (S). Effects of chronic administration of garlic (*Allium sativum* Linn) on testicular function. *Indian J. Exp. Biol.* 20(7); 1982; 534-6

Chronic administration of garlic powder (50 mg/day for 45 and 70 days) results in spermatogenic arrest in white albino rats. Inhibition of spermatogenesis in the testes is the secondary effect of hypoglycemia/hypolipidaemia. Total protein sialic acid contents of the testes were reduced. Garlic powder administration significantly brings about a reduction in serum/liver cholesterol, serum triglycerides, phospholipids and transaminase enzyme activity. Reduced concentration of sialic acid in the testes, epididymis and seminal vesicle together with decreased leydig cell function reflects antiandrogenic nature of garlic. AA

BEET

- 2758 ATTOE (EL) and VON ELBE (JH). Degradation kinetics of betanine in solutions as influenced by oxygen. *J. Agric. Food Chem.* 30(4); 1982; 708-12

The degradation kinetics of betanine were determined for nitrogen-flushed solutions. Trace levels of residual oxygen were found to influence pigment degradation unless a large molar excess of betanine was present. In the absence of oxygen, betanine stability was greatly enhanced and degradation occurred by a 0.5 reaction rate order. An activation energy of 30.7 ± 1.0 kcal/mol was calculated for this reaction. AA

- 2759 VON ELBE (JH) and SCHWARTZ (SJ). Absence of mutagenic activity and a short-term toxicity study of beet pigments as food colourants. *Arch. Toxicol.* 49(1); 1981; 93-8

Beet colourant was tested for mutagenic activity in five *S. typhimurium* strains. The absence of mutagenic activity was found with or without S-9 rat liver fractions. Groups of six rats were fed red beet colourant preparations containing 2000 ppm betalains in the diet for 7 days. No significant differences were noted in body weight gains, feed consumption, or gross pathological alterations compared to the controls. These preliminary toxicological results indicate the potential usage of betalain pigments as a food colourant, but further long term investigations are warranted. AA

CARROT

- 2760 ANDREOTTI (R), TOMASICCHIO (M) and MACCHIAVELLI (L). Studies on the freeze-drying of carrots and onions, after an initial partial air-drying. (Air-freeze-dried products). *Ind. Conserve.* 56(2); 1981; 87-91 (Italian)

When diced carrots and sliced onions were pre-dried in air to 50% of their weight, and then freeze-dried, the final products had only half the volume of the products obtained by freeze-drying alone. On rehydration, the

air-freeze-dried and freeze-dried products had similar quality characteristics; the rehydrated, air-freeze-dried carrots, however, had a deeper colour. The energy requirement of the air-freeze-drying process is shown to be about 40% less than that of freeze-drying alone. KMD

POTATO

- 2761 SHYAM (M). Criteria for separating potato tubers into different size grades. *J. Agric. Eng.* 19(4); 1982; 77-83
Three major dimensions and weight of 2000 tubers each of the three popular varieties of potato were measured. Linear and square-root relations were established for the maximum tuber with and thickness separately with tuber weight for each variety. Results of precise screening of bulk of potatoes of different varieties revealed that tubers were better adapted to the square-root relationship than the linear and that grade errors (weight-wise) were generally higher when grading was based on maximum tuber thickness than maximum tuber width. AA
- 2762 SHOMER (I), LINDNER (P), BEN-GERA (I) and VASILIVER (R). Ultrastructure of denaturated potato proteins. *J. Sci. Food Agric.* 33(6); 1982; 565-75
- 2763 BIZZARRI (G), ANDREOTTI (R) and MASSINI (R). Enzyme inactivation in spinach and potato: catalases, peroxidases, and phenolases. *Ind. Conserve.* 56(2); 1981; 97-102 (Italian)
Catalase in spinach and in potato can be irreversibly inactivated by a very mild heat treatment. Enzymes with the highest decimal-reduction time are the peroxidase in spinach; and the phenolase in potato. Phenolase inactivation is always irreversible, but peroxidase has a remarkable capacity to regain its activity. Heat processing times required to prevent regeneration of peroxidase activity are about twice as long as those sufficient for complete, but only temporary, inactivation. KMD
- 2764 DESBOROUGH (SL), LIENER (IE) and LULAI (EC). The nutritional quality of potato protein from intraspecific hybrids. *Qualitas Plantarum.* 31(1); 1981; 11-20
The nutritional value of potato hybrids with groups andigena, phureja and tuberosum parentage was measured by protein efficiency ratio (PER). The hybrids had higher PER values than group tuberosum varieties. The overall mean PER was 2.3, and 12 of the potato-flake diets were not different from the casein controls. Fortification with isoleucine did not improve the nutritional quality of the potato flakes. One diet was improved with the addition of both isoleucine and methionine. Protein from these potato hybrids, as measured by PER, is among the highest in biological quality when compared with other plant proteins foods. AA
- 2765 KLEIN (LB), CHANDRA (S) and MONDY (NI). Effects of magnesium fertilization on the quality of potatoes: Total nitrogen, nonprotein nitrogen, protein, amino acids, minerals and firmness. *J. Agric. Food Chem.* 30(4); 1982; 754-7
The effect of magnesium fertilization on total nitrogen, nonprotein nitrogen, protein content, and amino acid composition as well as firmness and mineral content of Katahdin potatoes was examined. Magnesium sulphate was applied at rates of 0, 40 and 100 lb/acre. At all levels of fertilization, total nitrogen, protein and the summation of both free and total amino acids of tubers were increased. Nonprotein nitrogen and mineral content varied with the year of cultivation. Tubers from plants receiving magnesium fertilization were significantly firmer than controls. AA

- 2766 NOTERMANS (S), DUFRENNE (J) and KEIJBETS (MJH). Vacuum-packed cooked potatoes: Toxin production by *Clostridium botulinum* and shelf life. *J. Food Prot.* 44(8); 1981; 572-5,579

The potential risk of toxin production by *Clostridium botulinum* in vacuum-packed and subsequently cooked potatoes (95 C for 40 minutes) was determined. Spores of both proteolytic and non-proteolytic *C. botulinum* survived the cooking process. Vacuum-packed cooked potatoes seemed to be an ideal substrate for *C. botulinum* to produce toxin. At storage temperatures of 10, 15 and 20 C, toxin production occurred before the product was spoiled. Only if stored at temperatures below 4 C can the product be guaranteed to have no potential public health risk. AA

- 2767 SUGIYAMA (H), WOODBURN (M), YANG (KH) and MOVROYDIS (C). Production of botulinum toxin in inoculated pack studies of foil-wrapped baked potatoes. *J. Food Prot.* 44(12); 1981; 896-8,902

Idaho Russet Burbank potatoes were surface or stab inoculated with 10 to 10^5 spores of *Clostridium botulinum* type. A strain, overwrapped in aluminium foil, baked at 204 C for 50 minutes or 96 C for 3 hours and then held at 22 or 30 C. The shortest incubations resulting in the first botulinogenic potatoes were inversely related to spore doses and ranged from 3 to 7 days; potatoes inoculated with 10 spores were toxic after 5 to 7 days. Total toxin in individual potatoes incubated 3 to 5 days were 5×10^3 to 5×10^5 mouse mean lethal doses. Toxin was not found at distances greater than 1.6 cm from the spore inoculation site. Results indicate that left-over, foil-wrapped, baked potatoes are a perishable food that must be refrigerated. AA

CASSAVA

- 2768 BICKARD (JE). Biochemical changes involved in the postharvest deterioration of cassava roots. *Trop. Sci.* 23(3); 1981; 235-7

Cassava roots which were injured by a transverse cut were observed to form a patchy blue-green and brown pigmented layer on the wound surfaces when held at high humidity (80-90% RH). Biochemical analysis showed that many changes in the phenolic constituents of the roots occurred following injury but the increased fluorescence was mainly due to the production of scopoletin and same scopolin. Spectrophotometric analysis of cassava root extracts demonstrated that considerable increases in total phenol, leucoanthocyanidin and flavanol content (Table 1) were occurring in these root pieces. These experiments have indicated the complexity of the changes occurring in cassava roots and substantiate previous indications that post-harvest deterioration of cassava roots commences as a non-specific response to wounding. VR

- 2769 PLUMBLEY (RA) and HUGHES (PA). DEAE-cellulose separation of peroxidases from cassava (*Manihot esculenta* crantz) root tissue. *J. Food Biochem.* 6(3); 1982; 197-206

- 2770 SINGH (L) and BOSE (S). Tapioca starch: A potential source of nutritive sweeteners. *Indian Sugar.* 32(5); 1982; 309-12

Utilization of tapioca starch for the production of glucose syrup, crystalline dextrose, maltose and high fructose glycosyl syrup has been reviewed. MVG

YAM

- 2771 SHARMA (KK) and PATTABIRAMAN (TN). Natural plant enzyme inhibitors, purification and properties of an amylase inhibitor from yam (*Dioscorea alata*). *J. Sci. Food Agric.* 33(3); 1982; 255-62
- 2772 GRAMSHAW (JW) and OSINOWO (FAO). Volatile components of cooked tubers of the water yam (*Dioscorea alata*). *J. Sci. Food Agric.* 33(1); 1982; 71-80
In addition to hydrogen sulphide and a number of high boiling fatty acids, 29 compounds comprising seven hydrocarbons, eight alcohols, eight aldehydes, four ketones, and furan and a disulphide, were identified for the first time in yam. A further five components were tentatively identified by GLC-MS and by TLC of derivatives. KAR

ALFALFA

- 2773 HILL (BD), CHARNETSKI (WA), SCHAAALJE (GB) and SCHABER (BD). Persistence of fenvalerate in alfalfa: Effect of growth dilution and heat units on residue half-life. *J. Agric. Food Chem.* 30(4); 1982; 653-7
Fenvalerate (cyano(3-phenoxyphenyl)methyl 4-chloro- α -(1-methylethyl)benzeneacetate) was applied to alfalfa at 0.14-0.15 kg/ha in three experiments, and the residues, crop growth, and weather were monitored for 28 days. Initial residues of 22.2-32.5 ppm declined exponentially with a half-life of 9-11 days. When fenvalerate was applied early in the season, the advantage of growth dilution of the residues was negated by cooler temperatures slowing the rate of decline of the chemical itself. The half-life of the chemical per se, with the effect of growth dilution removed, was 11-19 days, depending on the weather after application. Cumulative heat units were used to correlate residue decline to both time and temperature, and the concept of residue half-life in degree-days was introduced. The result was a half-life of 153-189 degree-days above 5 C for fenvalerate residues in alfalfa. AA
- 2774 KNUCKLES (BE) and KOHLER (GO). Functional properties of edible protein concentrates from alfalfa. *J. Agric. Food Chem.* 30(4); 1982; 748-52
Functional properties of an edible spray-dried alfalfa protein concentrate were evaluated. The nitrogen solubility of this product was greater than that of the soy protein isolate. The nitrogen solubility and gelation were adversely affected by a high spray dryer outlet temperature (140 C). The alfalfa protein concentrate absorbed at least 20% more oil than soy protein. Emulsions formed with 2% alfalfa protein solutions and oil were stable and had the consistency of mayonaise. Heating solutions of 3% alfalfa protein to 72 C and cooling resulted in the formation of firm gels. Whipping alfalfa protein solutions (2.5%) formed large volumes of foam (about 10 times the solution volume). When stabilized with sucrose and baked, these foams resembled egg meringue. AA
- 2775 GONNELLI (M), BALESTRERI (E) and FELICOLI (R). Alfalfa trypsin inhibitor inhibits alfalfa leaf proteinase. *J. Agric. Food Chem.* 30(4); 1982; 770-71
The alfalfa (*Medicago sativa*) leaf trypsin inhibitor inhibits the alfalfa leaf proteinase. This inhibition is strictly dependent on ionic strength. AA

BRUSSELS SPROUT

- 2776 FENWICK (GR), GRIFFITHS (NM) and HEANEY (RK). Bitterness in Brussels sprouts (*Brassica oleracea* L. var. *gemmifera*): The role of glucosinolates and their breakdown products. *J. Sci. Food Agric.* 34(1); 1983; 73-80

The bitterness associated with certain cultivars of Brussels sprouts has been shown to be linked to the presence of the glucosinolates, sinigrin and progoitrin. Whereas the former compound is bitter *per se*, the bitterness associated with the latter compound is due to its decomposition product, the goitrogen (-)5-vinyloxazolidine-2-thione. A method is described for the screening of cultivars of this, and other, *Brassica* vegetables for potential bitterness. AA

TOMATO

- 2777 McGLASSON (WB), McBRIDE (RL), McGRATH (DJ), SMITH (EF) and BEST (DJ). Influence of harvest maturity and ripening temperature on acceptability of North Queensland fresh market tomatoes. *Food Technol. Aust.* 34(6); 1982; 291-3

Two cultivars of tomatoes were obtained at staggered intervals at the mature green stage and at an early colour stage of ripening (breaker) and evaluated after ripening at 13 and 20 C respectively. The panel rated the most ripe tomatoes as very good to satisfactory. Fruit harvested mature green and ripened at 13 C were rated at least as acceptable as fruit harvested at the breaker stage and ripened at 20 C. KAR

- 2778 BUESCHER (RW) and HOBSON (GE). Role of calcium and chelating agents in regulating the degradation of tomato fruit tissue by polygalacturonase. *J. Food Biochem.* 6(3); 1982; 147-60
- 2779 MARSHALL (MR) and CHISM (GW). Conversion of exogenous cytokinins to biologically active compounds in tomato tissue. Evidence for an enzyme mediated reaction. *J. Food Biochem.* 6(3); 1982; 161-73
- 2780 LOGSDON (DA) and HULTIN (HO). Some properties of a microsomal fraction prepared from tomato fruit. *J. Food Biochem.* 6(3); 1982; 175-85
- 2781 MARSHALL (WD). Preprocessing oxidative washes with alkaline hypochlorite to remove ethylenebis (dithiocarbamate) fungicide residues from tomatoes and green beans. *J. Agric. Food Chem.* 30(4); 1982; 649-52
- A four-minute preprocessing wash with dilute alkaline hydrochlorite followed by a 30-s dip into dilute sodium sulphite was demonstrated to reduce field residues of ethylenebis(dithiocarbamate) (EBDC) and ethylene-thiourea (ETU) on green beans and tomatoes, to the limits of analytical significance. Subsequent processing of the washed tomatoes into juice did not raise levels of ETU whereas boiling unwashed green beans resulted in significant ETU residues on the beans and in the cooking water. This decontamination technique is thus demonstrated effective on a second crop and for a second EBDC fungicide. AA
- 2782 TUCKER (GA), ROBERTSON (NG) and GRIERSON (D). Purification and changes in activities of tomato pectinesterase isoenzymes. *J. Sci. Food Agric.* 33(4); 1982; 396-400

- 2783 NATALI (P), DEL RE (A) and MOLINARI (GP). Contaminants in industrially processed tomatoes. I. Copper, iron and zinc. *Ind. Conserve.* 56(2); 1981; 82-6 (Italian)

Residues of Cu, Fe, and Zn in processed tomatoes were estimated at various stages in a factory that was supplied with tomatoes which had been treated, while in the field, with either copper oxychloride or Zineb. The residues measured on fresh fruits were all below the limits fixed by the Italian food laws and by EEC regulations. The residues found in the raw material were due to the pesticide treatment applied in the field, whereas the residues present in the double or triple concentrates were due to uptake from the factory equipment. KMD

- 2784 DRAKE (SR) and PRICE (LG). pH and quality of home-canned tomato-vegetable mixtures. *J. Food Quality.* 5(2); 1981; 145-53

Home canned tomato-vegetable mixture collected from Washington and Idaho when analysed showed that 3% had visible mold growth, 6% had a pH greater than 4.5 and 2.6% exceeded at pH of 4.7. It was determined that home canners of tomato-vegetable mixtures do not follow any recommended canning procedures, do not acidify tomato-vegetable mixtures and process by a boiling water bath. KAR

CUCUMBER

- 2785 DAESCHEL (MA) and FLEMING (HP). Entrance and growth of lactic acid bacteria in gas-exchanged, brined cucumbers. *Appl. Environ. Microbiol.* 42(6); 1981; 1111-8

FRUITS

- 2786 MORRIS (LL). Chilling injury of horticultural crops: An overview. *Hortscience.* 17(2); 1982; 161-2

This brief overview covers aspects like symptoms of chilling injury, physiological responses, reduction of chilling injury, and retrospect and prospect of chilling injury. KAR

- 2787 COUEY (HM). Chilling injury of crops of tropical and subtropical origin. *Hortscience.* 17(2); 1982; 162-5

The crops covered include avocado, banana, mango, papaya and citrus. KAR

- 2788 BRAMLAGE (WJ). Chilling injury of crops of temperate origin. *Hortscience.* 17(2); 1982; 165-8

The article covers variation in chilling injury in crops, symptoms of temperate crop chilling injury, factors affecting chilling injury, overcoming or circumventing chilling injury, and physiology and nature of chilling. KAR

- 2789 LOWINGS (PH) and CUTTS (DF). The preservation of fresh fruits and vegetables. *IFST Proc.* 15(2); 1982; 52-4

Deals briefly about a specific mixture called 'Pro-long' developed from a mixture of lipids mixed with polysaccharide for giving as coating to fruits and vegetables. KAR

- 2790 NEWSOME (WH). Determination of triforine in fruit crops as *N,N'*-bis(pentafluorobenzoyl)piperazine. *J. Agric. Food Chem.* 30(4); 1982; 778-9

A method was developed for the determination of triforine and its piperazine metabolites in fruit. The procedure involves hydrolysis to piperazine, isolation of the piperazine by ion-exchange chromatography, and determination of the pentafluorobenzoyl derivative by gas-liquid chromatography with electron capture detection. The minimum limit of detection was 0.05 ppm, and recoveries from five crops fortified at the 0.10-ppm level averaged 91%. AA

- 2791 SHAW (PE) and WILSON (CW). Separation of fructose, glucose and sucrose in fruit by high performance liquid chromatography using UV detection at 190 nm. *J. Sci. Food Agric.* 34(1); 1983; 109-12

Fructose, glucose and sucrose were separated by high performance liquid chromatography (h.p.l.c.) on a 5 μ m amine column and detected by absorbance at 190 nm. The procedure quantified these sugars in orange juice and in carambola fruit, but preliminary ion exchange column chromatography was necessary before satisfactory h.p.l.c. results could be obtained. The method is sensitive to 1.2 μ g of fructose or 9 μ g of glucose or sucrose. AA

- 2792 KAMEL (BS). Nutritional properties of some agricultural seed byproducts. *J. Food Quality.* 5(2); 1981; 139-44

Different agricultural seeds: apple, citrus, lufa, maple and pumpkin were analysed for protein, fat, food energy, calcium, phosphorus, fatty acids and the amino acid profile. KAR

BLUEBERRY

- 2793 NORVELL (DJ) and MOORE (JN). An evaluation of chilling models for estimating rest requirements of Highbush Blueberries (*Vaccinium corymbosum* L.). *J. Am. Soc. Hortic. Sci.* 107(1); 1982; 54-6

Experiments utilizing both natural and artificial chilling conditions were conducted to evaluate chilling models for estimating rest completion. Temperatures of 1 and 12 C were effective in satisfying the rest requirements of blueberries, but were less effective than 6 C. KAR

STRAWBERRY

- 2794 SISTRUNK (WA), MORRIS (JR) and KOZUP (J). The effect of chemical treatments and heat on colour stability of frozen machine harvested strawberries for jam. *J. Am. Soc. Hortic. Sci.* 107(4); 1982; 693-7

Treatment with NaHSO_3 , citric acid, or SnCl_2 improved the colour of the jam. The jam made from frozen puree browned more during storage than that made from whole fruit. KAR

- 2795 SKREDE (G). Quality characterisation of strawberries for industrial jam production. *J. Sci. Food Agric.* 33(1); 1982; 48-54

The investigation involved chemical, physical and sensory analyses of fresh and frozen/thawed fruits as well as jam at the time of production and after 3 months of storage. The results disclosed that pH, titratable

acidity, and sugars of fresh fruits to be less important to jam quality. High contents of soluble solids, and ascorbic acid were related to undesirable flavour quality. Further high levels of ascorbic acid adversely affected colour stability. Colour degradation in jams was parallel to flavour deterioration. It is concluded that the main emphasis should be given to characteristics of the final products rather than to characteristics of the fresh fruits. KAR

CHRYSOPHYLLUM ALBIDUM

- 2796 NWADINIGWE (CA). Nutritional value and mineral contents of *Chrysophyllum albidum* fruit. *J. Sci. Food Agric.* 33(3); 1982; 283-6

GRAPE

- 2797 CHAUHAN (VS) and SINGH (IS). Effect of crop regulation on drop, ripening, yield and quality of Beauty Seedless Grape vines trained on kniffin. *Prog. Hortic.* 13(2); 1981; 5-10

Cluster thinned to 16+ berry thinning was most effective treatment in reducing the berry drop, shot, berries, enhancing ripening and improving fruit quality. However, total yield per berry was decreased considerably by this treatment. Hence to obtain optimum yield and quality cluster thinned to 24 per vine + berry thinning may be the ideal treatment. KAR

- 2798 MESIAS (JL), MAYNAR (JL) and MARECA (I). Contribution to the study of the volatile components of the grapes of Tierra de Barros (Badajoz). *Rev. Agroquim. Tecnol. Aliment.* 21(1); 1981; 114-20 (Spanish)

The composition of the volatile fraction of the "less aromatic" Cayetana and Pardina grapes from Tierro de Barros (Badajoz, Spain) were studied, as a function of harvest date. The volatiles were isolated by solvent extraction and separation from the juice by means of mixing with magnesium sulphate and then extracted again with acetone. A large number of esters were detected; the terpene content was negligible. With ripeness, aroma and sugar contents also increased, but their maxima did not coincide. KMD

BANANA

- 2799 TRIPATHI (VK), RAM (HB), JAIN (SP) and SURJEET SINGH. Changes in developing banana fruit. *Progr. Hortic.* 13(1); 1981; 45-53

During ripening of banana (Var Bhos, Basrai Dwarf Dudhiamal Bhog and Barsian) there was no substantial change except the increase in pulp to peel ratio. TSS, acidity, protein, pectin, tyrosine, and sugars indicated a rising trend while ascorbic acid, phosphate and starch lowering trend. The starch content in ripe fruits was strikingly lower associated with marked increase in tyrosine and sugar contents. The weight loss and rate of respiration appear to be invariably connected with each other in all the varieties of banana. KAR

GRAPEFRUIT

- 2800 PURVIS (AC) and GRIERSON (W). Accumulation of reducing sugar and resistance of grapefruit peel to chilling injury as related to winter temperatures. *J. Am. Soc. Hortic. Sci.* 107(1); 1982; 139-42

Resistance of grapefruit (*Citrus paradisi* Macf.) to chilling injury (CI) was compared with the concentration of reducing sugars in the peel through 3 harvesting seasons. Accumulation of reducing sugars preceded increased resistance to CI. The increase in reducing sugar concentration at mid-season (December-February) resulted from the hydrolysis of sucrose which is regulated by temperature. Accumulation of reducing sugars may be prerequisite to increased resistance of grapefruit to CI, but the role(s) of reducing sugars in the resistance mechanism has not been determined. AA

- 2801 McINTOSH (CA), MANSELL (RL) and ROUSEFF (RL). Distribution of limonin in the fruit tissues of nine grapefruit cultivars. *J. Agric. Food Chem.* 30(4); 1982; 689-92

This report presents the results of a study conducted to determine the distribution of limonin within the fruit tissues of nine grapefruit cultivars. It was found that the highest limonin levels within the fruit tissues were found in the cotyledon, followed by inner seed coat, outer seed coat, central pith, segment membrane, albedo and flavedo, and juice vesicles, in decreasing amounts. The concentration of limonin in the tissues of the individual cultivars is also presented, and the variation in limonin content within a single tissue and within single fruit is discussed. The limonin content of the fruit of the nine cultivars was also compared. The overall results showed that Davis Krome was significantly higher in limonin content followed by Triumph, Duncan, White Marsh, and Foster Pink (which were statistically equivalent to each other) and then by Thompson Pink, Wheeney, and Mott. Leonardy contained the lowest ppm of limonin. The ranking of the cultivars according to the limonin content of each tissue is also presented. AA

- 2802 HALTON (TT) and CUBBEDGE (RH). Conditioning Florida grapefruit to reduce chilling injury during low-temperature storage. *J. Am. Soc. Hortic. Sci.* 107(1); 1982; 57-60

Constant storage of grapefruit at 1 C for 28 days resulted in excessive chilling injury (CI); however conditioning the fruit for 7 days at 10, 16 or 21 C significantly reduced chilling injury during 21 days of storage at 1 C. KAR

ORANGE

- 2803 DOVELL (CJ) and HARRIS (ND). Development of a method to measure dietary fibre in oranges. *J. Sci. Food Agric.* 33(2); 1982; 185-93

A method to measure dietary fibre in oranges has been developed. Pectin was extracted from the food sample using heat, acid and a cation-exchange resin. This was followed by enzymic digestions, using pepsin and pancreatin, of the remaining residue. Optimal levels of resin, pH, time and temperature for maximum pectin extraction were found. Optimal levels of enzymes and pH for maximal enzyme digestion was also found. Other food products tested for dietary fibre content were: cauliflower,

oranges, pole beans, carrots and whole wheat flour. Values found were greater than those for other fibre analyses; however, most other methods fail to measure the water-soluble indigestible components, such as pectin. AA

- 2804 CARMAN (GE), IWATA (Y), DUSCH (ME), DINOFF (TM) and GUNTHER (FA). Residues of malathion and methidathion on and in fruit after dilute and low-volume spraying of orange trees. *Bull. Environ. Contam. Toxicol.* 27(6); 1981; 864-8

SWEET ORANGE

- 2805 BHULLAR (JS), AGNIHOTRI (RP) and SHARMA (R). Evaluation of wax emulsion, benlate and some growth regulators for extending the shelf life of Valencia late fruits. *Prog. Hortic.* 13(2); 1981; 31-6

Valencia sweet orange late fruits were treated with wax emulsion (60%), Benlate (125 and 250 ppm) 2,4-D (50 and 100 ppm), 2,4,5-T (100 and 150 ppm) carbaryl (1000 and 2000 ppm), CCC (1000 and 2000 ppm), MH (500 and 1000 ppm) and stored at 15.5 to 30.0 C and 57 to 71% RH for 60 days. The lowest physiological loss in weight was indicated by wax treated fruits. Benlate at the lower dose was best for extending the storage life of fruits with minimum rotting among all the treatments tried. Juice content and titratable acidity decreased with the prolongation of the storage period, whereas the TSS and sugars increased during the storage. KAR

- 2806 GOVIND (S) and PRASAD (A). Effect of nitrogen nutrition on the storage of sweet orange cv Mosambi (*Citrus sinensis*). *Progr. Hortic.* 13(1); 1981; 39-43

Nitrogen was applied at 400, 800 and 1200 g/tree. Maximum spoilage was found in fruits harvested from unfertilized than fertilized trees after 45 days of storage. Nitrogen fertilization reduced loss in weight and loss of weight was minimum in 1200 g N treatment. Increasing rate of N-levels reduced losses in acidity and ascorbic acid content. KAR

MANGO

- 2807 PATHAK (RA) and SINGH (RD). A note on the effect of auxin H-61 and planofix on the retention, size and weight of mango fruit, cv Langra. *Progr. Hortic.* 13(2); 1981; 65-9

Auxin H-61 (150 and 200 ppm) and Planofix (20 and 30 ppm) were sprayed on trees first at pea stage followed by the second spray at the marble stage. Size of fruits did not show much difference, however increase in weight was only noted. KAR

- 2808 ABD EL-BAKI (MM), ASKAR (A), EL-SAMAHY (SK) and ABD EL-FADEEL (MG). Studies on mango flavour. *Dtsch. Lebensmittel-Rundschau.* 77(4); 1981; 139-42

The volatile constituents of three mango varieties have been investigated by gas chromatography. The major components were identified as camphene, myrcene, limonene, ocinene, linalool, citronellol and α -terpineol. The volatile flavouring material was also quantitatively determined

as oxygenated terpenes, limonene, carbonyl compounds and ester content. In addition, chemical and physical composition of the three mango varieties were investigated. The 'Zebda' mango, one of the choicest varieties of Egyptian mangoes, has excellent flavour and colour, in accord with its relatively high content of oxygenated terpenes, carbonyl compounds, ascorbic acid and carotenoids. The 'Baladi' mango is characterized by a strong fruity aroma and a relatively high content of esters, limonene and acids. The "pairy" mango has a mild aroma in accord with its low content of all volatile flavouring material, but a relative high sugar content. AA

APRICOT

- 2809 SOUTY (M), THIBAUT (J-F), NAVARRO-GARCIA (G), LOPEZ-ROCA (J-M), and BREUILS (L). The pectic substances from apricot (*Prunus armeniaca* L.) C.V. Rouge Du Roussillon. General characteristics and ion exchange chromatography study. *Sci. Aliment.* 1(1); 1981; 67-80 (French)

Pectic substances from apricot, cv. Rouge du Roussillon, were studied after extraction successively by water, ammonium oxalate and hot diluted hydrochloric acid. The anhydrogalacturonic acid content of the three fractions was determined quantitatively by the m-hydroxy-diphenyl method while the neutral sugars were determined using orcinol method. This fractional extraction of pectic substances gives three different fractions: the water-soluble fraction (PS) and the fraction extracted by HCl (PH) are very important (nearly 50% each) while the oxalate-soluble fraction (PO) is very poor (less than 4%). Each fraction has a high neutral sugars content and a high methoxyl content. The percentage of acetylation of the apricot pectin is very high (about 4.4%). DEA Sepharose CL 6 B chromatography leads to the separation, in each fraction, of the pure pectin from the non pectic neutral sugars. AA

- 2810 VAMOS-VIGYAZO (L), GAJZAGO (I) and NADUDVARI MARKUS (V). Polyphenol oxidase and peroxidase activities of apricots (*Prunus armeniaca* L.) as affected by cultivar, location, and year of harvest. *Qualitas plantarum.* 31(1); 1981; 45-60

PEACH

- 2811 DEILY (KR) and RIZVI (SSH). Optimization of parameters for packaging of fresh peaches in polymeric films. *J. Food Process. Eng.* 5(1); 1982; 23-41

Fresh peaches were stored at 5 ± 1 C under various modified atmospheric conditions for 30 days. An interval atmosphere of 10-15% O₂ and 15 to 25% CO₂ inside the package provided better retention of quality. Springiness did not provide any significant index of quality. Soluble solids decreased overtime as did the amount of acid present in the fruit. Anaerobic fermentation did not occur under any storage condition. Permeability of polymeric films were determined using ASTM method. KAR

- 2812 CARTER (GE) Jr. and RILEY (MB). Residues of dibromochloropropane in fresh and preserved peaches. *J. Agric. Food Chem.* 30(4); 1982; 647-49
- 1,2-Dibromo-3-chloropropane (DBCP) and found at a level of 24.7 ppb in ripened peaches from orchards which had been fumigated 144 days prior to harvest. Peaches from trees in soil that was fumigated 270 days prior

to harvest contained DBCP at 0.32 ppb. Peaches from nonfumigated orchards were found to contain either DBCP or a compound which could not be distinguished from DBCP at levels of 0.13-0.26 ppb. Peaches preserved in 1948, prior to the release of DBCP, were found to contain 0.25 ppb of DBCP. The compound present in the preserved peaches could not be differentiated from authentic DBCP by either gas chromatography or mass spectrometry. Background levels of this compound complicate determination of DBCP residues in fresh peach fruit. AA

AVOCADO

- 2813 CHAPLIN (GR), WILLS (RBH) and GRAHAM (D). Objective measurement of chilling injury in the mesocarp of stored avocados. *Hortscience*. 17(2); 1982; 238-9

Coloured metabolites are extracted from chilled mesocarp and measured in a colorimeter which gives an objective estimation of chilling injury in stored avocados. KAR

PLUM

- 2814 LAL (H) and MISRA (SP). A note on the effect of G.A. and 2,4,5-T on fruit retention, ripening and quality of subtropical plum Cv. Jamuni (Titron). *Prog. Hortic.* 13(2); 1981; 55-60

Aqueous solutions of gibberellic acid (GA) at 50, 75 and 100 ppm and 2,4,5-T at 10, 15 and 20 ppm were sprayed first just after petal fall and second after 13 days of fruit setting in 1977 and 1978. Higher concentrations of GA and 2,4,5-T proved significantly effective in ripening the fruits 6 to 7 days earlier. Higher concentrations of these also improved the TSS and total sugars content whereas the titratable acidity in both the years decreased. KAR

APPLE

- 2815 LAU (OL) and LOONEY (NE). Improvement of fruit firmness and acidity in controlled-atmosphere-stored 'Golden Delicious' apples by a rapid O₂ reduction procedure. *J. Am. Soc. Hortic. Sci.* 107(4); 1982; 531-4

Apples subjected to rapid controlled-atmosphere (CA) (rapid reduction of O₂) was consistently 1 to 2 kg firmer and substantially higher in titratable acids than those in conventional CA or air storage at the conclusion of 6- to 8-month storage period. Long delays in air at 0 C or at ambient temperature before initiation of O₂ reduction resulted in softer fruit. KAR

- 2816 BLANPIED (GD) and SAMAN (LG). Internal ethylene concentrations of 'McIntosh' apples after harvest. *J. Am. Soc. Hortic. Sci.* 107(1); 1982; 91-3

In a low ethylene environment (<1 ppm) at 19 C, the rate of ethylene evolution was positively related to the concentration of ethylene in the cores of 'McIntosh' apples (*Malus domestica*, Borkh.). Maximum retention of flesh firmness at 1 C was associated with fruit internal ethylene concentrations below 1 ppm, which were obtained by ethylene removal from

the storage atmosphere in combination with 3 treatments to suppress ethylene biosynthesis; orchard-applied daminozide, early harvest, and low O₂ tension in storage. AA

- 2817 KNEE (M). Attempted isolation of fluorescent ageing pigments from apple fruits. *J. Sci. Food Agric.* 33(2); 1982; 209-12
The suitability of the lipofuscin assay for lipid peroxidation products in apple fruit has been investigated. Material with similar fluorescent properties to lipofuscin was extracted from apple. However, this fluorescence could be explained by the presence of cinnamoyl compounds and carotenoids in the extracts. AA
- 2818 BARON (A), PRIOULT (C) and DRILLEAU (J-F). Gelation of apple pectin. 1. Experimental method and study of the influence of pectin esterase concentration on pectin gelation. *Sci. Aliment.* 1(1); 1981; 81-9
The authors describe a method to monitor the gelation of enzymatically demethylated pectins in presence of calcium. The variations of light scattered in the reaction medium has enabled them to define the gelation properties by means of three parameters: initiation, time of gelation (AG), gelation velocity (VG) and the degree of pectin esterification at the onset of gelation (DE/AG). The first two parameters depend on the concentration of pectinesterase, while the third parameter is independent thereof. AA
- 2819 HANG (YD), LEE (CY), WOODAMS (EE) and COOLEY (HJ). Production of alcohol from apple pomace. *Appl. Environ. Microbiol.* 42(6); 1981; 1128-9
Production of ethyl alcohol from apple pomace with a Montrachet strain of *Saccharomyces cerevisiae* is described. More than 43 g of the ethyl alcohol could be produced per kg of apple pomace fermented at 30 C in 24 hours. The fermentation efficiency of this process was approximately 89%. AA

PEAR

- 2820 ROMANI (R), PUSCHMANN (R), FINCH (J) and BEUTEL (J). Effects of preharvest applications of AVG on ripening of 'Bartlett' pears with and without cold storage. *Hortscience.* 17(2); 1982; 214-5
- 2821 MELLENTIN (WM), CHEN (PM) and BORGIC (DM). In-line application of porous wax coating materials to reduce friction discolouration of 'Bartlett' and 'd' Anjou pears. *Hortscience.* 17(2); 1982; 215-7
Application of 400 ppm aminoethoxyvinylglycine (AVG) to pear trees 6 and 2 weeks before harvest resulted in marked but variable inhibition of postharvest ripening at 20 C. AVG amplified the usual nonuniformity in the initiation of ripening exhibited by freshly harvested fruit. Prolonged storage of the fruit at 0 to 2 C counteracted the inhibitory effects with resultant rapid and uniform ripening upon transfer to 20 C. KAR

BAOBAB FRUIT

- 2822 NOUR (AA), MAGBOUL (BI) and KHEIRI (NH). Chemical composition of baobab fruit (*Adansonia digitata* L.). *Trop. Sci.* 22(4); 1980; 383-8

The physical properties and chemical composition of the fruit of the baobab tree, *Adansonia digitata* L., were investigated. The pulp was found to be acidic, and rich in ascorbic acid, iron, calcium and pectin. The pectin was mainly water soluble and had a low degree of esterification and a low intrinsic viscosity. It was of a poorer quality than commercial pectin and citrus waste pectin. AA

SUGAR, STARCH AND CONFECTIONERY

SUGAR

- 2823 PALLOT (J). Carbohydrates and sugar alcohols - today and in future. *Gordian*. 81(4); 1981; 83-6,108-12 (German)
- 2824 BIRKHED (D), WANGE (B) and EDWARDSSON (S). Sugar and sugar alcohols in foods. *Var Foda*. 32(10); 1980; 511-9 (Swedish)
- Two hundred and twenty-eight samples of commercial food products were analyzed for sugars and sugar alcohols. The food groups covered were: sweetened foodstuffs without sucrose; marmalade, jam, and desserts; fresh and dried fruits; caviar and vinegar products; sugar-free sweets; breakfast cereals and biscuits; baby food; beverages; ice-cream and milk products; and miscellaneous products. The results have been evaluated from a caries-prophylactic point of view. KMD
- 2825 WESTIN (SI). Honey, sugar and sweeteners; development and consumption. *Var Foda*. 32(10); 1980; 495-501 (Swedish)
- A brief review of the use of sweeteners since prehistoric times. KMD

JAGGERY

- 2826 SHINDE (BN), MARATHE (AB) and KADAM (SK). Changes in specific gravity, pH, reducing and non-reducing sugar during boiling of sugarcane juice for preparation of jaggery. *Indian Sugar*. 32(2); 1982; 89-93
- Jaggery (brown sugar) samples collected at 30 minute intervals after removal of scum, on analysis, showed an increase in specific gravity and pH at later stages of boiling. Of the 4 samplings taken there was a sharp increase in reducing sugars from third to fourth sampling. This was attributed to the solution phase inversion (water dissolved in sugars) due to rise in acidity and temperature during boiling. MVG

STARCH

- 2827 BAIG (MM), BURGIN (CW) and CERDA (JJ). Fractionation and study of chemistry of pectic polysaccharides. *J. Agric. Food Chem.* 30(4); 1982; 768-70
- 2828 DICKINSON (E), McKAY (JE), THOMAS (VD) and WARUNEK (C). An improved viscometric method for monitoring starch degradation. *J. Sci. Food Agric.* 33(2); 1982; 194-6
- The advantages of concentric cylinder viscometer for monitoring the

kinetics of starch degradation are presented. It is particularly appropriate for studying non-Newtonian dispersions at the early stages of degradation. The rates of dissolution of wheat and soluble starches in dimethylsulphoxide at 25 C are clearly distinguished and the sensitivity of the extent of dissolution to the degree of agitation is demonstrated. The instrument provides a precise and convenient technique for following the hydrolysis of soluble starch by α -amylase. KAR

- 2829 HEYNS (K) and MAHLMANN (H). On the part played by phosphate in phosphate-modified starches. *Dtsch. Lebensmittel-Rundschau*. 77(4); 1981; 127-33 (German)
- 2830 HOLLO (J), LASZLO (E) and HOSCHKE (A). Biotechnical problems of isoglucose production. Part A. Production and characterization of immobilized glucoamylase. *Starch*. 33(2); 1981; 52-5
- 2831 KELLER (HW), REENTS (AC) and LARAWAY (JW). Process for fructose enrichment from fructose bearing solutions. *Starch*. 33(2); 1981; 55-7
- 2832 CHEN (LF), GONG (CS) and TSAO (GT). Immobilized glucose isomerase on DEAE cellulose beads. *Starch*. 33(2); 1981; 58-63
Purified glucose isomerase from *Actinoplanes missouriensis* was immobilized on porous DEAE cellulose beads by simple adsorption. The immobilized glucose isomerase retained over 70% of its original activity. The relative substrate flow rate can be kept at 0.04 cm/s or higher. The half life of the immobilized enzyme was at around 1000 hour at 60 C. AA
- 2833 BACHMAN (S), GEBICKA (L) and GASZYNA (Z). Immobilization of glucose isomerase on radiation-modified gelatin gel. *Starch*. 33(2); 1981; 63-6
Whole-cell glucose isomerase immobilization on radiation-modified gelatin gel was demonstrated. The enzyme was stabilized within the cells by heat treatment at 70 C. The heat-treated cells were mixed with radiation modified gelatine gel and crosslinked by glutaraldehyde. Immobilized enzyme exhibited 70-75% activity as compared to the free cells under various reaction conditions. A continuous isomerization was performed using a column packed with cell granules. It has been found that the half life of the immobilized glucose isomerase amounted to 650 hour at 60 C. AA

GUM

- 2834 SCHREIBER (P). Gelatin and gelatin gum sweets. *Gordian*. 81(1-2); 1981; 31 (German)
- 2835 RAMAKRISHNA NAYAK (B) and PATTABIRAMAN (TN). Studies on plant gums: Characterisation of neem (*Azadirachta indica*) gum protease as a glycoprotein. *J. Sci. Food Agric*. 33(3); 1982; 263-8

CONFECTIONERY

- 2836 SWEETMAKER. Starch jellies. The method of processing. *Confect. Prod*. 47(8); 1981; 370-71
- 2837 ANON. New confectionery packaging in USA. 'No Frills' food packages. *Confect. Prod*. 47(9); 1981; 420

- 2838 GROTHUS (P). Natural colours and their use in confections. *Manuf. Confect.* 61(11); 1981; 29-32
- 2839 LIEBRAND (J) and SMILES (R). Polydextrose for reduced calorie confections. *Manuf. Confect.* 61(11); 1981; 35-6,38-40
Discusses: applications; FDA status, safety, metabolism and laxative effect; low carcinogenic property; labeling and nutritional information; and storage. BSN
- 2840 ZUCKERMAN (S). Status report certified colour. *Manuf. Confect.* 61(10); 1981; 57-8

CHOCOLATE

- 2841 COLLINS-THOMPSON (DL), WEISS (KF), RIEDEL (GW) and CUSHING (CB). Survey of and microbiological guidelines for chocolate and chocolate products in Canada. *Can. Inst. Food Sci. Technol. J.* 14(3); 1981; 203-8
The microbiological quality and safety of domestic and imported finished chocolate products and liquid chocolate base were determined using aerobic colony counts (ACC), aerobic spore-formers (ASF), confirmed and faecal coliforms and *Salmonella*. Using these survey results, the following 3-class acceptance plans are recommended; ACC, $n = 5$, $c = 2$, $m = 3 \times 10^4/g$, $M = 1 \times 10^6/g$; confirmed coliforms, $n = 5$, $c = 2$, $m = 1.8/g$, $M = 100/g$. Imported chocolate products were found to be higher in ACC than were domestic and they had higher predicted lot rejection rates. All products tested were found to be *Salmonella* negative. AA

BAKERY PRODUCTS

- 2842 LaBAW (GD). Chemical leavening agents and their use in bakery products. *Baker's Dig.* 56(1); 1982; 16-8,20-21
A brief historical review of chemical leavening agents has been given. The mechanism of chemical leavening, neutralizing values and reaction rates were presented. The current chemical leaveners and their applications in formulating baked products was described. The pros and cons of making your own baking powders or of buying a commercial baking powder were discussed. KAR
- 2843 FELLERS (DA). Continuous, thin film dough/batter mixer. *Baker's Dig.* 56(5); 1982; 30-31
This is based on a U.S. Patent (NO.3,888,997 - 1979) wherein a continuous, thin film dough batter mixer called centrimixer is used. The article deals with this concept of dough mixing and the results of initial tests are given. KAR

BREAD

- 2844 HARMUTH-HOENE (A-E), SCHELENZ (R), FRETZDORFF (B), RABE (E) and SEIBEL (W). Effect of rye- and wheat-bread of different fibre content on absorption and retention of minerals and trace elements in growing rats. *Getreide Mehl Brot.* 35(3); 1981; 65-8 (German)

The resorption of Ca, Fe, Zn, Cu, and G was studied in rats fed on different kinds of bread with varying fibre content. Increasing contents of ballast material reduced resorption and retention of Fe, even when a high Fe supplement was included in the diet. Zn retention was also reduced at a high dietary fibre content. Further, enrichment with fibre reduces the caloric utilization of the diet. KMD

- 2845 TABEKHIA (MM) and EL-ESLY (N). Effect of various methods of common Egyptian breadmaking (Native bread) on hydrolysis of phytic acid. *Dtsch. Lebensmittel-Rundschau*. 77(6); 1981; 214-6

Common Egyptian bread (native bread) is manufactured by two methods of dough fermentation namely yeast-controlled and spontaneous fermentation. Phytic acid, total phosphorus, inorganic phosphorus and inositol content were estimated during various stages of breadmaking. Results indicated that yeast controlled fermentation was more effective in breaking down phytic acid and increasing the inorganic phosphorus and inositol than spontaneous fermentation. Simple correlation coefficient was calculated for all possible combinations between phytic acid and inorganic phosphorus and inositol for both methods of breadmaking. The correlation coefficient between phytic acid and inorganic phosphorus for yeast controlled and spontaneous fermentation was $r = (-0.854^{**})$ and $r = (0.294)$ respectively. AA

- 2846 SLUIMER (P). Principles of fermentation-interruption in the production of wheat breads. *Getreide Mehl Brot*. 35(1); 1981. 18-21

The duration of bread manufacture depends, above all, on the fermentation period. While using the technique of fermentation interruption in the Netherlands in 1972, following errors cropped up: reddish brown crusts, rough pores, small bread volume. These errors were successfully eliminated by extensive investigations especially by an easily understandable "Gas theory". The dough development occurs during the kneading, the CO_2 production during the dough formation is kept low and the temperature gradient during heating is also kept low. Today it is possible, with the help of fermentation interruption, to produce wheat bread of good quality. VR

- 2847 SCHAUZ (H). Fermentation interruption and delay in the production of rye and rye mixed bread. *Getreide Mehl Brot*. 35(1); 1981; 21-3

- 2848 THOMAS (B) and WOLF (E). The contribution of the spread to the calorie value of bread slices (sandwiches). *Getreide Mehl Brot*. 35(1); 1981; 13-8

- 2849 FEARN (T) and RUSSELL (PL). A kinetic study of bread staling by differential scanning calorimetry. The effect of loaf specific volume. *J. Sci. Food Agric*. 33(6); 1982; 537-48

Changes in the starch fraction of bread at 21 C have been measured as a function of loaf specific volume using differential scanning calorimetry (DSC). Data from five bakes were fitted by Avrami equations $\Phi = \exp(-kt^n)$ (where Φ is the fraction of the total thermal change still to occur) using an iterative non-linear least squares procedure which enabled simultaneous estimation of limiting value, rate constant (k) and Avrami exponent (n). The method allowed the fit of a number of different models to be tested. It was concluded that Avrami exponents from each bake were the same and <1 and that the rate constants were also equal. For comparison, crumb compressibility measurements were made on

the same loaves used for DSC. These data were also analysed in a similar way. An adequate fit in this case was given by an Avrami exponent of 1; however, rate constants appeared to vary with loaf specific volume. AA

CAKE

- 2850 GAINES (CS) and DONELSON (JR). Cake batter viscosity and expansion upon heating. *Cereal Chem.* 59(4); 1982; 237-40

PASTRY

- 2851 HUBER (H). Enlargement of the assortment of fine pastry, by addition of interesting specialities of other countries. *Getreide Mehl Brot.* 35(3); 1981; 70-5 (German)

MILK AND DAIRY PRODUCTS

- 2852 ANON. Symposium: "Quality Control in the Food Industry" at Lodi, 19-20 Nov., 1980 held at the Milk and Cheese Experimental Institute. *Ind. Aliment.* 20(182); 1981; 280-288

Texts of the following 5 papers have been printed: HULT (D): Rapid determination of moisture in meat and meat-based products, with the Evatec system. (p.280-281); DeMEZZI (G) and ROGATE (R): Microwave drying for the rapid determination of moisture in milk and cheese products. (p. 282-284); LISSONI (M): Rapid determination of sulphur anhydride (SO₂) in foods. (p.284-285); RONDININI (G): Control of environmental hygiene in the milk-cheese sector of production and processing. (p.285-286); SIMONETTI (P): Direct determination of salt content in meat products. (p. 286-288). KMD

- 2853 ANON. Development of HTST technology: systems, plants, standards of choice. *Ind. Aliment.* 20(179); 1981; 43-5,53 (Italian)

The author discusses the relative advantages and disadvantages of two HTST (high-temperature, short-time) systems for the sterilization of milk, viz: direct injection of steam, and indirect heat exchange in a plate or tube heat exchanger. The first system consumes 4-5 times as much energy as the second, and also destabilizes the protein and causes gelification. Hence, the indirect, plate heat-exchangers are bound to become more popular in Italy, as in other countries. The firm, Sordi, has 15 years of experience in their manufacture. KMD

- 2854 VISSER (RA). Supersaturation of α -lactose in aqueous solutions in mutarotation equilibrium. *Neth. Milk Dairy J.* 36(2); 1982; 89-101

- 2855 SCHWENKE (KD), RAUSCHAL (EJ), LINOW (KJ) and PAHTZ (W). Chemical modification of proteins. Part 7. Influence of succinylation on the physico-chemical and functional properties of casein. *Nahrung.* 25(2); 1981; 201-12 (German)

Succinylation of the amino-groups of the casein complex leads to a spontaneous dissociation of the protein into low molecular 1,8-S components. The components migrate to a greater extent in alkaline buffer

systems, and to a lesser extent in acidic buffer systems. Potentiometric acid-base titration of the casein derivatives reveals a hysteresis effect which indicates a greater or lesser loss of structure (entropy production). The effects of succinylation on solubility minima, oil-binding capacity, and emulsifying capacity have also been reported. KMD

- 2856 HOOKER (PH), MUNRO (PA) and O'MEARA (GM). Reduction of the viscosity of sodium caseinate solutions by enzymic hydrolysis. *NZ. J. Dairy Sci. Technol.* 17(1); 1982; 35-40

The proteolytic enzymes, Alcalase, papain and pepsin were used to reduce the viscosity of sodium caseinate solutions. The aim of the study was to reduce spray drying costs for sodium caseinate by producing solutions of greatly reduced viscosity so that solids concentrations fed to the drier could be increased. Alcalase and papain caused precipitation of casein from sodium caseinate solutions at low degrees of hydrolysis and so were unsuitable. The maximum viscosity reduction achieved without casein precipitation was only 77% using pepsin at pH 6.0 and 31.8% w/w sodium caseinate. At 20% w/w sodium caseinate the viscosity reduction achieved was only 66%. This viscosity reduction would allow an increase in solids concentration to the spray drier of about 1% w/w, which is too low to be commercially useful. AA

- 2857 PARK (DL) and MORGAN (D). Dairy herd mastitis quality control program. *J. Food Prot.* 44(12); 1981; 921-2,927

- 2858 BULL (MA), STERRITT (RM) and LESTER (JN). Some methods available for treatment of waste water in the dairy industry. *J. Chem. Technol. Bio-Technol.* 31(10); 1981; 579-83

MILK

- 2859 GALLUSSER (A) and BERGNER (K-G). Free and masked sulphydryl groups in directly heated UHT milk packed with and without headspace. *Dtsch. Lebensmittel-Rundschau.* 77(10); 1981; 356-61 (German)

In directly heated UHT milk packaged with and without headspace, the authors determined free and masked SH groups through DTNB potentiometrically and polarographically. With DTNB after denaturing the protein with SDS and also potentiometrically with or without denaturing, it was found that SH groups decreased in both types of milk, to a degree corresponding to 10 mg per litre of cysteine, during ten weeks of storage. A potentiometrical determination without preceding denaturation did in fact cover all SH groups that can also be attacked by oxygen; yet the overall content of SH groups measured was too low. AA

- 2860 GALLUSSER (A) and BERGNER (K-G). Reactivation of alkaline phosphatase in UHT milk as a function of the milks oxygen content. *Dtsch. Lebensmittel-Rundschau.* 77(12); 1981; 441-4 (German)

We determined the reactivation of alkaline phosphatase in directly heated UHT milk packaged with and without head space. It was found that it was much less in high-oxygen-content packages than in low-oxygen ones. This is attributed to the fact that SH groups required in the reactivation get oxidized in oxygen-rich milk. AA

- 2861 KING (JS) and MABBITT (LA). Preservation of raw milk by the addition of carbon dioxide. *J. Dairy Res.* 49(3); 1982; 439-47
 The effects of concentrations of 10-30 mM/l of CO₂ on the growth of psychrotrophic milk spoilage organisms were examined, both in untreated whole milk and in pure cultures of *Pseudomonas fluorescens* growing in skim-milk and broth. Spoilage of refrigerated untreated whole milk was found to be inhibited by the addition of CO₂ and the effect was enhanced with increasing concentrations of CO₂ and decreasing storage temperature. Experiments with pure cultures of *Ps. fluorescens* showed that the inhibitory effects of CO₂ were not due to increased acidity or to displacement of dissolved O₂, but to the presence of CO₂ *per se* which induced an increase in the duration of the lag phase of growth and had only a small effect on the logarithmic phase. AA
- 2862 HORNE (DS) and PARKER (TG). Factors affecting the ethanol stability of bovine milk. V. Effects of chemical modification of milk protein. *J. Dairy Res.* 49(3); 1982; 449-57
- 2863 STORRY (JE) and FORD (GD). Some factors affecting the post clotting development of coagulum strength in renneted milk. *J. Dairy Res.* 49(3); 1982; 469-77
- 2864 WEBB (LE). Detection by Warburg manometry of compounds stimulatory to lactic acid bacteria. *J. Dairy Res.* 49(3); 1982; 479-86
- 2865 ANON. Method for the production of lactose free milk tested. *Gordian.* 81(4); 1981; 92-3 (German)
- 2866 TIMMS (RE), ROUPAS (P) and ROGERS (WO). The content of dissolved oxygen in air-saturated liquid and crystallized anhydrous milk fat. *Aust. J. Dairy Technol.* 37(1); 1982; 39-40
- 2867 SHARMA (RS) and SUKHMINDER SINGH. Recovery of milk fat and sulphuric acid from the Gerber test waste and their utilization. *Indian J. Dairy Sci.* 34(4); 1981; 364-9
- 2868 FLUX (DS), RAVEN (JS) and GRAY (IK). Accuracy of milko-tester over a wide range of milk fat concentrations. *NZ. J. Dairy Sci. Technol.* 17(1); 1982; 15-25
 The correlation between the concentrations measured by the Gerber and *Milko-tester* methods was found to be very high (>0.996). KAR
- 2869 JOHNSTON (KA) and WOOLLARD (GA). Determination of moisture in anhydrous milkfat by Karl Fischer titration. *NZ. J. Dairy Sci. Technol.* 17(1); 1982; 55-62
- 2870 TOYODA (M), ITO (Y), IWAIDA (M), UTSUGI (Y), OHASHI (M) and FUJII (M). Simple and rapid determination of hydrogen peroxide contained in milk by use of an oxygen electrode. *NZ. J. Dairy Sci. Technol.* 17(1); 1982; 41-6
 A method for the routine determination of the concentration of hydrogen peroxide contained in milk was developed, using a new, sensitive detection apparatus (*Oritector* Model III). The method involved purging the dissolved oxygen from the milk, adding catalase solution and measuring the resultant oxygen with a sensitive oxygen electrode. The recovery of hydrogen peroxide added to milk (1 mg/l) was more than 95%. The time

required for one analysis was less than 10 minutes. Hydroperoxide formed from milk lipid appeared to have an important effect upon the determination. AA

- 2871 MARTIN-LOMAS (M), MARTINEZ-UTRILLA (R), MARTINEZ-CASTRO (I) and JUAREZ (M). Identification of carbonyl compounds in transesterified fats: Detection in milk fat. *Fette Seifen Anstrichem.* 83(1); 1981; 7-10
- 2872 van HOOYDONK (ACM) and OLIEMAN (C). A rapid and sensitive high-performance liquid chromatography method of following the action of chymosin in milk. *Neth. Milk Dairy J.* 36(2); 1982; 153-8
 The proteolysis of kappa (x-)casein by chymosin during the curdling of milk has been followed by a method that is based on the quantitative determination of the glycomacropeptide that is split off by gel permeation chromatography in the HPLC mode. The preparation of the sample is quite simple, and is limited by the precipitation of interfering casein and whey proteins with trichloroacetic acid (final concentration 8%). The method is highly suitable for determining the proteolytic activity of curd preparates, and also for the determination of the quantity of kappa-casein in milk, and the quantity of cheese-whey powder in milk powder. KMD
- 2873 HOPPNER (K) and LAMPI (B). Seasonal variation of folacin levels in market fluid milks. *Can. Inst. Food Sci. Technol. J.* 14(3); 1981; 218-9
 Market fluid milks were studied for seasonal variations of folacin levels. Skim milk contained the highest average levels of folacin (48 µg/L) followed in order by 2% (46 µg/L), homogenized (45 µg/L) and chocolate milk (41 µg/L). Buttermilk averaged 89 µg/L reflecting the folacin contributed by the culturing bacteria. Except for minor fluctuations, there was no indication that the levels of folacin in fresh fluid market milks, excluding buttermilk, vary significantly during the year. AA
- 2874 COX (BL), KRZEMINSKI (LF) and HORTON (IB). Determination of chlorobutanol in milk, serum, and tissues by a one-step cleanup and gas-liquid chromatography. *J. Agric. Food Chem.* 30(4); 1982; 702-5
 A quantitative procedure for the determination of chlorobutanol in milk, serum, and tissues is described. A special distillation/extraction apparatus was designed to isolate the chlorobutanol in a single step. The chlorobutanol was quantitated on a 5-foot, 5% XE-60 column by electron capture detection with a 2-mCi ⁶³Ni source. The average percent recovery ± the standard deviation for chlorobutanol in milk over the 10-60-ppb range was 95.2 ± 2.7%. The average recovery for all tissues and serum at the 10-ppb level was 86.6 ± 3.8%. No interfering peaks were observed at the retention time of chlorobutanol. The analysis time for a single assay was 2 hours. AA
- 2875 SANDMEYER (U). Fast examination of milk to detect chlorinated hydrocarbons by means of automatic gel chromatography. *Dtsch. Lebensmittel-Rundschau.* 77(5); 1981; 175-8 (German)
- 2876 JURDI (DA) and ASMAR (JA). Use of simple fermentation test to detect antibiotic residues in milk. *J. Food Prot.* 44(9); 1981; 674-6
 The sensitivity of a local Lebanese yogurt culture to different antibiotics was checked, using either a fresh or a freeze-dried culture. Laban fermentation was significantly affected by 0.005 IU of penicillin/ml, 1 µg of streptomycin/ml, 1 µg of dihydrostreptomycin/ml, 10 µg of chloram-

phenicol/ml and a level of oxytetracycline between 0.05 and 0.5 µg/ml. Although the method was not standardized, it was used to check 858 milk samples in Lebanon of which 11.20% were found to contain lactic acid bacterial inhibitory substances. AA

- 2877 MACAULAY (DM) and PACKARD (VS). Evaluation of methods used to detect antibiotic residues in milk. *J. Food Prot.* 44(9); 1981; 696-8
- 2878 KULKARNI (MB), BHOSALE (DN) and CHAVAN (IG). Effect of mixing evening milk with morning milk on acidity development and organoleptic qualities *Indian J. Dairy Sci.* 34(4); 1981; 474-77
- 2879 SCHRODER (MJA). Effect of oxygen on the keeping quality of milk. I. Oxidized flavour development and oxygen uptake in milk in relation to oxygen availability. *J. Dairy Res.* 49(3); 1982; 407-24
- 2880 SCHRODER (MJA). Effect of oxygen on the keeping quality of milk. II. Effect of available oxygen on bacterial spoilage and oxygen uptake. *J. Dairy Res.* 49(3); 1982; 425-37
- 2881 BAGNACANI (L), SPAGNI (L) and ALBONI (D). Commercial use of refrigerated milk and its application in the production of Parmesan cheese. *Ind. Aliment.* 20(179); 1981; 22-4 (Italian)
- Refrigeration of milk, at 8 C, can cause several difficulties in the manufacture of Parmesan (or Parmigiano Reggiano) cheese. The cream does not solidify (fix), or is fixed badly due to the change in the fat/casein ratio. Thus, though one can obtain a Parmesan cheese from refrigerated milk, it is not equal to the Parmesan cheese - especially in consistency - to the real product made from unrefrigerated milk. KMD
- 2882 TINSON (W), HILLIER (AJ) and JAGO (GR). Metabolism of *Streptococcus thermophilus*. 1. Utilization of lactose, glucose and galactose. *Aust. J. Dairy Technol.* 37(1); 1982; 8-13
- The hydrolysis of lactose in *S. thermophilus* was catalysed by the enzyme β -galactosidase. This enzyme was synthesized constitutively when the cells were grown on glucose and was induced 2-4 fold by the addition of lactose or galactose to the growth medium. The addition of glucose to cells growing on lactose caused a severe transient repression of β -galactosidase synthesis. All the *S. thermophilus* strains tested utilized only the glucose moiety of lactose when grown in the presence of excess lactose. When growth was limited by the lactose concentration only one of six strains tested was able to utilize fully the galactose portion of lactose. AA
- 2883 TINSON (W), BROOME (MC), HILLIER (AJ) and JAGO (GR). Metabolism of *Streptococcus thermophilus*. 2. Production of CO₂ and NH₃ from urea. *Aust. J. Dairy Technol.* 37(1); 1982; 14-6
- S. thermophilus* species utilized more lactose, produced more CO₂ and a higher pH in milk cultures than the group N Streptococci. The higher pH of the milk cultures was due to the ability of *S. thermophilus* to hydrolyse the urea present in milk, to CO₂ and NH₃. Because NH₃ neutralizes acid produced by the organism, titratable acidity or pH changes cannot be used to follow lactic acid production in milk cultures of *S. thermophilus*. AA

- 2884 TINSON (W), HILLIER (AJ) and JAGO (GR). Metabolism of *Streptococcus thermophilus*. 4. Utilization of pyruvate and citrate. *Aust. J. Dairy Technol.* 37(1); 1982; 22-5

Unlike the group N streptococci, *S. thermophilus* did not appear to possess an active pyruvate, dehydrogenase system or utilize significant amounts of pyruvate at pH 5.0-5.5. The maximum utilization of pyruvate by *S. thermophilus* occurred at pH 7.0 and α -acetolactate was the major product formed. All the strains of *S. thermophilus* tested were unable to utilize citrate. AA

- 2885 DUNSMORE (DG) and BATES (PJ). Attachment of bacteria to glass surfaces immersed in milk. *Aust. J. Dairy Technol.* 37(1); 1982; 35-6

The adherence characteristics of *Ps. aeruginosa*, *E. coli*, *S. faecalis* and *M. luteus* with respect to different time intervals in milk have been described. KAR

- 2886 SOOD (SM), BALI (RK), GAIND (DK) and DEWAN (RK). Voluminosity of casein micelles from buffalo and cow milks in different buffer solutions. *Indian J. Dairy Sci.* 34(4); 1981; 359-63

- 2887 BINDAL (MP), WADHWA (BK) and JAIN (MK). Neutral lipids from buffalo milk fat globule membrane. *Indian J. Dairy Sci.* 34(4); 1981; 370-78

- 2888 KAUR (S), SINDHU (JS) and ROY (NK). Distribution of the major minerals between soluble and colloidal phases of buffalo milk as affected by pH. *J. Food Process. Preserv.* 7(1); 1983; 9-18

- 2889 MATHUR (ON) and ROY (NK). Studies on trace minerals in buffaloes' milk. III. Zinc. *Indian J. Dairy Sci.* 34(4); 1981; 379-84

- 2890 SINDHU (JS) and ROY (NK). Distribution of ^{45}Ca between soluble and colloidal phases of buffaloes' milk as affected by processing. *J. Sci. Food Agric.* 33(3); 1982; 299-302

- 2891 GREGORY (JF).III. Denaturation of the folacin-binding protein in pasteurized milk products. *J. Nutr.* 112(7); 1982; 1329-38

- 2892 VREMAN (K) and POORTVLIET (LJ). Pesticide levels in milk and milk products in relation to their milk fat content. *Neth. Milk Dairy J.* 36(2); 1982; 145-8

In order to investigate the influence of the fat content of milk products on their retention of pesticides, the pesticide residues in various milk products - such as cream, separated milk, and low-fat fresh cheese - were measured. It was established that milk products having a low fat content carry a greater load of pesticides per gram of fat present in the product. This may be because the fat globules in low-fat products are smaller in size, and have therefore, a greater surface area per gram of fat. Hence, the authors recommend that different legal limits for pesticide residues must be set for whole-milk and low-fat-milk products. KMD

- 2893 CLUSKEY (F). Use of milk substitutes in compound coatings. *Manuf. Confect.* 61(10); 1981; 53-5

- 2894 KALOGRIDOU-VASSILIADOU (D) and LAW (BA). Sensitivity of proteinase detection in milk with hide powder azure: Comparison with direct observations of casein proteolysis. *J. Dairy Res.* 49(3); 1982; 511-4

- 2895 VALLETRISCO (M), STEFANELLI (C) and NIDLA (I). Commercial characterization of some milk powders sold in Campania. *Ind. Aliment.* 20(182); 1981; 264-6 (Italian)

Milk powders, originating from various EEC countries, and sold in Campania, have been analyzed, with special attention to their content of sodium bicarbonate which is used as a neutralizer and aid to solubility. To arrive at a final conclusion and recommendation, the authors suggest that other additives like lecithin, and "trace substances" used in animal husbandry should also be analyzed. KMD

- 2896 JENSEN (GK) and NIELSEN (P). Reviews of the progress of dairy science: Milk powder and recombination of milk and milk products. *J. Dairy Res.* 49(3); 1982; 515-44

- 2897 WOOLLARD (DC). The determination of cocoa solids in milk powder products using high performance liquid chromatography. *NZ. J. Dairy Sci. Technol.* 17(1); 1982; 63-8

A method has been developed, using theobromine as the indicator, to measure the concentration of cocoa in blended milk powder products. Theobromine is determined in the cocoa solids and the finished product using high performance liquid chromatography. An accurate answer is not possible unless a sample of the cocoa solids is available. Sample preparation was effectively achieved using solubilisation in hot water and protein precipitation by trichloroacetic acid, avoiding preliminary fat extraction. Chromatography was performed isocratically using methanol/water/acetic acid on a C18 reverse phase column and UV detection at 280 nm. AA

YOGURT

- 2898 DRIESSEN (FM), KINGMA (F) and STADHOUDERS (J). Evidence that *Lactobacillus bulgaricus* in yogurt is stimulated by carbon dioxide produced by *Streptococcus thermophilus*. *Neth. Milk Dairy J.* 36(2); 1982; 135-44

L. bulgaricus Ib needs ≥ 31 mg CO₂ per kg milk for optimal growth. If 40 mg of sodium formate and more than 31 mg CO₂ are added per kg of milk then a pure culture of *L. bulgaricus* can grow in milk as fast as when it forms a part of a mixed culture. *S. thermophilus* Str. produced more CO₂ in milk than is required for the optimal growth of *L. bulgaricus* Ib. Removal of CO₂ during heat treatment (or evacuation) of yogurt milk does not appreciably retard the acid production of the mixed culture, due to the rapid formation of CO₂ by *S. thermophilus*. KMD

- 2899 BOUILLANNE (C) and DESMAZEAUD (MJ). Method of grouping some *Lactobacillus bulgaricus* strains according to some technological characteristics. Association with *Streptococcus thermophilus*. *Sci. Aliment.* 1(1); 1981; 7-17 (French)

Strains of *Lactobacillus bulgaricus* were classified according to the rate and amount of lactic acid production, and their ability to produce lactic acid when stored at 4 or 12 C after normal growth at 44 C. Acetaldehyde formation was taken as a criterion of aroma production; the values obtained varied from 1 to 6.5. A variation of 1 to 6 in viscosity was also reported, after normal growth in milk. Adoption of a multi-variate method (correspondence analysis) enabled the authors to group the strains into various clusters. A comparison with *Streptococcus thermophilus* was made, with the object of selecting strains most suitable for yogurt making. KMD

BUTTER

- 2900 TANIMURA (S), NAKABAYASHI (A) and KATAYAMA (H). Development of propionaldehyde in cultured butter during storage. *NZ. J. Dairy Sci. Technol.* 17(1); 1982; 47-53

Cultured butter underwent rapid oxidative deterioration when stored at 5 C or higher. In contrast, deterioration was only slight when stored at -20 C. When stored for 12 months, the oxidized flavour became apparent when the peroxide value exceeded 0.5 meq/kg butter. KAR

WHEY

- 2901 JELEN (P). Reprocessing of whey and other dairy wastes for use as food ingredients. *Food Technol.* 37(2); 1983; 81-4
- Article reviews some of the current techniques available to industrial dairy processors, for reprocessing of dairy by-products. After discussing the whey processing operations, the author covers aspects like protein recovery, lactose hydrolysis, new dairy foods, and use of new dairy ingredients. KAR
- 2902 ENNIS (BM) and HIGGINS (JJ). Demineralization of deproteinated sweet whey. An economic study. *NZ. J. Dairy Sci. Technol.* 17(1); 1982; 27-34
- 2903 KLETER (G), LAMMERS (WL) and VOS (EA). The influence of pH and concentration of lactic acid and NaCl on the growth of *Clostridium tyrobutyricum* in whey and cheese. Experiments in whey. *Neth. Milk Dairy J.* 36(2); 1982; 79-87

The influence of pH, lactic acid concentration, and NaCl concentration, and the initial number of bacteria on growth of *Clostridium tyrobutyricum* in modified whey was studied. All these factors influenced the possibilities of growth; they were also found to have an effect on each other in inhibiting bacterial growth. KMD

CHEESE

- 2904 ZERFIRIDIS (GK) and MANOLKIDIS (KS). Contents of nitrates and nitrites in some Greek and imported cheeses. *J. Food Prot.* 44(8); 1981; 516-9
- Fifty-four samples of various types of Greek cheese and 69 samples of imported cheese were analyzed for nitrates and nitrites. Domestic Gruyere from cow's milk and processed cheese contained 1-10 and 35-104 mg of NO_3^- per kg, respectively. All other domestic cheeses were either free of or contained nitrates less than 1 mg/kg. Imported cheese contained nitrates as follows: Edam 1-11, Gouda 1-24, Teleme 13-81, Goudasana 27, processed cheese 0-8, cheese spread 19-30, bacon cheese 24-508 and others < 4 mg/kg. All types of domestic and imported cheese were either negative for nitrites or contained < 1 mg/kg. AA
- 2905 DEMOTT (BJ), DRAUGHON (FA) and HERALD (PJ). Fermentation of lactose in direct-acid-set cottage cheese whey. *J. Food Prot.* 44(8); 1981; 588-90, 592

Kluyveromyces fragilis was more suitable than *Candida pseudotropicalis* or *K. lactis* for the production of ethanol from whey. Direct-acid-set, cottage-cheese whey, and the supernatant fluid resulting from heat treat-

ment of the whey at 95 C for 20 minutes showed similar rates of fermentation when inoculated with *K. fragilis*. Temperatures between 35 and 42 C resulted in a more rapid production of ethanol than a temperature ≤ 30 C. Lactose conversion was 83% complete in whey, and 77% complete in whey supernatant fluid. KMD

- 2906 TRIEU-CUOT (P) and GRIPON (J-C). A study of proteolysis during camembert cheese ripening using isoelectric focussing and two-dimensional electrophoresis. *J. Dairy Res.* 49(3); 1982; 501-10
- 2907 SIU (M) and THOMPSON (LU). *In vitro* and *in vivo* digestibilities of succinylated cheese whey protein concentrates. *J. Agric. Food Chem.* 30(4); 1982; 743-7
- 2908 LAWRENCE (RC) and GILLES (J). Factors that determine the pH of young cheddar cheese. *NZ. J. Dairy Sci. Technol.* 17(1); 1982; 1-14
Review article covering aspects like, effect of running acidity and salt acidity on cheese pH, buffering capacity of curd, seasonal variation in buffering capacity, starter activity after salting, relation between pH and salt-in-moisture; residual lactose in curd at salting, and variation in pH within a single block of cheese. KAR
- 2909 YANG (CST), TARANTO (MV) and CHERYAN (M). Optimization of textural and morphological properties of a soy-gelatin mozzarella cheese analog. *J. Food Process. Preserv.* 7(1); 1983; 41-64
- 2910 SCOTT (PM). Toxins of *Penicillium* species used in cheese manufacture. *J. Food Prot.* 44(9); 1981; 702-10
- 2911 IBRAHIM (GF) and BALDOCK (AK). Thermostable deoxyribonuclease content and enterotoxigenicity of cheddar cheese made with sub-normal starter activity. *J. Food Prot.* 44(9); 1981; 655-60, 664
- 2912 ANON. Cheese substitutes. *Food Process. Ind.* 50(600); 1981; 48,49,51
- 2913 EL-SAFETY (MS), ELLEN (A) and FAHMY (N). Use of salted whey to reconstitute dried milk for manufacturing white soft cheese. I. Character of the curd. *J. Food Prot.* 44(9); 1981; 652-4,664
Dried skim or whole milk was used for manufacture of Domiati cheese, the popular soft white cheese in Egypt. Salted whey instead of water was used for reconstitution of non-fat dry milk and/or dried whole milk. Use of whey caused a decrease in curd firmness. Increasing the amount of CaCl_2 and rennet improved curd firmness. Yield of cheese made using salted whey was higher than when cheese was made without using salted whey. Salted whey gave the cheese a flavour of pickled cheese of 45 days of age. AA

MEAT AND POULTRY

- 2914 SWATLAND (HJ). Electrical capacitance measurements on intact carcasses. *J. Anim. Sci.* 53(3); 1981; 666-9

- 2915 SEIDEMAN (SC) and CROSS (HR). Utilization of electrical stimulation to improve meat quality: A review. *J. Food Quality*. 5(4); 1982; 247-69
Aspects covered include rate of glycolysis, tenderness quality, mechanism of tenderization, effect on flavour quality, carcass quality, retail appearance and microbiological aspects. KAR
- 2916 JONES (TM), CLARK (HR), BEALE (GS), ABELL (LA) and VANDEGRIFT (V). Characterization of coagulant-protein complexes produced by chemical coagulation of industrial whole animal blood. *J. Agric. Food Chem.* 30(4); 1982; 715-9
- 2917 HUSBAND (PM). The history of vacuum packed meat. *Food Technol. Aust.* 34(6); 1982; 272,274-5
Vacuum packing of meat has developed over the past ten years and is now of considerable importance in the Australian meat industry. Aspects of this development are reviewed and problems encountered discussed. The importance of vacuum packing in transport and marketing trends is also considered. AA
- 2918 ALEXEEFF (GV), MUNOZ (P) and KILGORE (WW). Bromide ion measurements in animal tissue using an indicator with thin-layer chromatography. *J. Agric. Food Chem.* 30(4); 1982; 780-82
- 2919 FLORES (J), NIETO (P), CLEMENTE (G) and MIRALLES (MC). Rapid determination of nitrogen, phosphorus, and hydroxyproline in meat and meat products with a continuous-flow autoanalyzer. *Rev. Agroquim. Tecnol. Aliment.* 21(1); 1981; 121-30 (Spanish)
The results obtained with a continuous flow analytical system (ANA-320 of Technicon) have been compared with those obtained by the Spanish official methods. No significant differences were found; the correlation coefficients were 0.9978 for N, 0.9990 for P₁ and 0.9999 for hydroxyproline. Thus, the continuous flow analyzer may be used for routine quality control of meat products. KMD
- 2920 SEGAL (HL) and PARKS (AC). Mechanism and regulation of protein turnover in higher animals. *CRC Crit. Rev. Food Sci. Nutr.* 16(2); 1982; 141-7
- 2921 FRASER (TH). Microbial factories for the production of animal proteins. *CRC Crit. Rev. Food Sci. Nutr.* 16(2); 1982; 217-27
- 2922 FIRSTENBERG-EDEN (R). Rapid estimation of the number of microorganisms in raw meat by impedance measurement. *Food Technol.* 37(1); 1983; 64-7, 69-70
The feasibility of using fully automated impedance measurement system has been evaluated for estimating levels of microbial contamination in raw meat of particular interest in this evaluation, were the speed with which impedimetric estimates could be made, the correlation between the method and the standard plate count, and the influence of sample preparation procedure upon the impedimetric estimation of the number of microorganisms in meat. KAR
- 2923 HOLLEY (RA). Review of the potential hazard from botulism in curd meats. *Can. Inst. Food Sci. Technol. J.* 14(3); 1981; 183-95
Discusses: natural contamination by *E. botulinum*; nitrite as anti-microbial agent; possible mode of nitrite action; recent developments in

cured meat preservation; assessment of risk; and overall product safety. BSN

- 2924 D'AUBERT (S), ARTAVANIS (S), DeGAETANO (A) and CANTONI (C). *Pseudomonas* in some foods. *Ind. Aliment.* 20(182); 1981; 271-5
The distribution of *Pseudomonas* spp. in some foods (meat, poultry, meat, fish, and egg) has been reported. KMD
- 2925 LOCKER (RH). A new view of meat tenderness. *Food Technol. NZ.* 17(5); 1982; 33-5
Work at the Meat Industry Research Institute on a neglected component of muscle, the "gap filaments" raises interesting new questions for muscular contraction, and at the same time the basis of meat tenderness, that is, the relationships between the various protein filaments which form the structure of meat and their differing reactions to heat. AA
- 2926 PORTEOUS (JD). The collagen content of various sausage meats. *Can. Inst. Food Sci. Technol. J.* 14(3); 1981; 224-6
Collagen data is presented for 15 beef, 41 hog, and 25 sow cuts and trimmings. This data supplements the physico-chemical "constants" for sausage meats published previously and should be of interest to those involved in least-cost, constant-quality and computer formulation of sausage products. AA
- 2927 BANKS (JG) and BOARD (RG). Comparison of methods for the determination of free and bound sulphur dioxide in stored British fresh sausage. *J. Sci. Food Agric.* 33(2); 1982; 197-203
A modified spectrophotometric assay for free sulphur dioxide in sausage recovered significantly more SO₂ than an electronic ion-selective probe method. The former was less variable than the latter. KAR
- 2928 RACCACH (M). Control of *Staphylococcus aureus* in dry sausage by a newly developed meat starter culture and phenolic-type antioxidants. *J. Food Prot.* 44(9); 1981; 665-9
- 2929 BENAZZI (C) and SANDRI (S). Packaging of mortadella in aluminium foil. Some hygienic and marketing considerations. *Ind. Aliment.* 20(182); 1981; 267-70 (German)
An aluminium foil laminate has been designed which enables the producer "mortadella" sausages to cook the product in the bag so that a temperature of at least 69 C is reached at the centre of the product. Thus, U.S. hygienic requirements would be met, without any deterioration in the flavour and taste of the traditionally prepared product. Such heating, if done in normal cans of tin-plate affects the organoleptic quality of the product. KMD
- 2930 HANSEN (C). Methods for animal waste recovery and energy conservation. *Food Technol.* 37(2); 1983; 77-80,84
The different processes available such as chemical processing of blood, reverse osmosis for blood fractionation, mechanical deboning, bone protein extraction, ultrafiltration for recovery of protein from waste water, use of sludge from meat packaging waste water, pretreatment plants, tumbling or massaging hot deboning, production of single cell proteins, alternative liquid concentration, recycling scald-tank water, precision control of relative humidity in coolers, and biogas production are the

aspects covered in the article. Suggestions have also given for further research work. KAR

BEEF

- 2931 SAVELL (JW), SMITH (GC), HANNA (MO) and VANDERZANT (C). Packaging of beef loin steaks in 75% O₂ plus 25% CO₂. I. Physical and sensory properties. *J. Food Prot.* 44(12); 1981; 923-27
- 2932 HANNA (MO), VANDERZANT (C), SMITH (GC) and SAVELL (JW). Packaging of beef loin steaks in 75% O₂ plus 25% CO₂. II. Microbiological properties. *J. Food Prot.* 44(12); 1981; 928-33
- 2933 NIEMAND (JG), VAN DER LINDE (HJ) and HOLZAPFEL (WH). Radurization of prime beef cuts. *J. Food Prot.* 44(9); 1981; 677-81
- 2934 FRANCIS (SJ), ALLEN (DM), KASTNER (CL) and DeFELICIO (PE). The effect of curing method on beef *Longissimus* muscle shear force values. *J. Anim. Sci.* 52(6); 1981; 1294-7
- 2935 TERRELL (RN), MING (CG), JACOBS (JA), SMITH (GC) and CARPENTER (ZL). Effect of chloride salts, acid phosphate and electrical stimulation on pH and moisture loss from beef clod muscles. *J. Anim. Sci.* 53(3); 1981; 658-62
- 2936 OUALI (A). Variation between muscles of the effect of ageing on myofibrillar ATPase activity. *Sci. Aliment.* 1(1); 1981; 1-6 (French)
The myofibrillar ATPase activity was measured at different ionic strengths on six bovine muscles after one, three and ten days of storage. During ageing, the alteration of this hydrolytic activity differed significantly between muscles of the same animal both in its rate and in its intensity. The differences between muscles appeared as early as the third day post mortem, and persisted after ten days of storage. AA
- 2937 GRAU (FH). Role of pH, lactate, and anaerobiosis in controlling the growth of some fermentative Gram-negative bacteria on beef. *Appl. Environ. Microbiol.* 42(6); 1981; 1043-50
- 2938 STERN (NJ). Selectivity and sensitivity of three media for recovery of inoculated *Campylobacter fetus* ssp. *jejuni* from ground beef. *J. Food Safety.* 4(3); 1982; 169-75
- 2939 HUFFMAN (DL), BRITTON (JR) and CORDRAY (JC). Effect of pressing on moisture loss and sensory properties of beef. *J. Food Quality.* 5(2); 1981; 103-8
- 2940 WING (KM), SEIDEMAN (SC), QUENZER (NM) and DURLAND (PR). The influence of salt and hydrolyzed vegetable protein on the sensory attributes of ground cow beef patties. *J. Food Quality.* 5(2); 1981; 155-60
- 2941 CORTESI (ML) and VACCARO (A). Researches on the storage of chilled buffalo meat. *Ind. Aliment.* 20(179); 1981; 9-14 (Italian)
Problems concerned with the shelf-life of chilled buffalo meat are not substantially different from those of beef, as far as halves stored in air, and vacuum-packaged meat are concerned. KMD

- 2942 COLLINS-THOMPSON (DL) and RODRIQUEZ LOPEZ (G). Depletion of sodium nitrite by lactic acid bacteria isolated from vacuum-packaged bologna. *J. Food Prot.* 44(8); 1981; 593-5
- 2943 ASGHAR (A) and HENRICKSON (RL). Functional properties of food-grade bovine hide collagen in coarse bologna. 2. Effect on different protein fractions. *J. Food Prot.* 5(4); 1982; 271-84
- 2944 DAVIS (GW), COLE (AB), BACKUS (WR) Jr. and MELTON (SL). Effect of electrical stimulation on carcass quality and meat palatability of beef from forage and grain-finished steers. *J. Anim. Sci.* 53(3); 1981; 651-7

LAMB

- 2945 WSZOLEK (PC), HOGUE (DE) and LISK (DJ). Accumulation of fenvalerate insecticide in lamb tissues. *Bull. Environ. Contam. Toxicol.* 27(6); 1981; 869-71

PORK

- 2946 PRINCE (TJ), KUHLEERS (DL), JUNGST (SB), MARPLE (DN), CORDRAY (JC), HUFFMAN (DL), EASON (JT) and LITTLE (JA). Prediction equations for estimating the quantity of muscle in 25- to 45- kg pigs. *J. Anim. Sci.* 53(3); 1981; 663-5
- 2947 KIMOTO (WI), PENSABENE (JW) and FIDDLER (W). Isolation and identification of N-nitrosothiazolidine in fried bacon. *J. Agric. Food Chem.* 30(4); 1982; 757-60

An unidentified possible nitrosamine observed in extracts from fried bacon obtained by the mineral oil distillation procedure, which elutes after N-nitrosopyrrolidine when analyzed by gas chromatography-thermal energy analyzer, was shown to be N-nitrosothiazolidine (NTHZ). This substance had the same gas chromatographic retention time and low-resolution mass spectrum as standard NTHZ. Preliminary investigations indicate that most, but not all, of it is produced artifactually as a result of analysis when residual nitrite is present prior to analysis. AA

- 2948 WATSON (A) and PATTERSON (RLS). Tainting of pork meat by 1,4-dichlorobenzene. *J. Sci. Food Agric.* 33(1); 1982; 103-5
- Pork meat rejected by consumers because of a nauseating taint was analysed by GLC and MS and found to contain 5-20 mg/kg of 1,4-dichlorobenzene. KAR

- 2949 SPAHL (A), REINECCIUS (G) and TATINI (S). Storage life of pork chops in CO₂ containing atmospheres. *J. Food Prot.* 44(9); 1981; 670-73

- 2950 JEREMIAH (LE). The effects of frozen storage and protective storage wrap on the retail case-life of pork loin chops. *J. Food Quality.* 5(4); 1982; 311-26

The results indicated that the pork loin chops could be frozen and stored for 168 days or less at -30 C and have a retail case life of at least 6 days. KAR

- 2951 DUCHENE (M), DEROANNE (CL) and ELLOY (CL). Effect of different packaging materials on refrigerated and frozen ground pork patties. *Food Sci. + Technol.* 14(2); 1981; 100-104 (French)
- 2952 SCHANTZ (PM). Trichinosis in the United States - 1947-1981. *Food Technol.* 37(3); 1983; 83-6
- 2953 MURRELL (KD). Preslaughter control of trichinosis. *Food Technol.* 37(3); 1983; 87-90
- 2954 KOTULA (AW). Postslaughter control of *Trichinella spiralis*. *Food Technol.* 37(3); 1983; 91-4
- 2955 LEIGHTY (JC). Regulatory action to control *Trichinella spiralis*. *Food Technol.* 37(3); 1983; 95-7
- 2956 RUITENBERG (EJ), VAN KNAPEN (F) and ELGERSMA (A). Incidence and control of *Trichinella spiralis* throughout the world. *Food Technol.* 37(3); 1983; 98-100

SWINE

- 2957 SHARMA (RP), STREET (JC) and SHUPE (JL). Translocation of lead and cadmium from feed to edible tissues of swine. *J. Food Safety.* 4(3); 1982; 151-63

KANGAROO MEAT

- 2958 ANON. Kangaroo meat. *Br. Food J.* 84(909); 1982; 115,117

POULTRY

CHICKEN

- 2959 BAKER (RC), POON (W), KLINE (D) and VADEHRA (DV). Antimicrobial properties of lauricidin in mechanically deboned chicken, minced fish and chicken sausage. *J. Food Safety.* 4(3); 1982; 177-84
- Aerobic plate counts on Plate Count Agar at 25 C were used to determine the time required to reach a microbial spoilage level of 1.0×10^7 C.F.U./g, for mechanically deboned chicken meat, minced fish and chicken sausage stored at 2 C. The storage times were 5, 8 and 9 days, respectively. Addition of citric acid (0.2%), ascorbic acid (0.2%) or lauricidin (250 ppm) alone extended the shelf-life by 0-2 days. The combination of lauricidin and citric acid or lauricidin and ascorbic acid extended the time required to reach a microbial spoilage level for mechanically deboned chicken meat by as much as 7 days, minced fish by as much 4 days and chicken sausage by 8 days. AA
- 2960 PIVNICK (H), BLANCHFIELD (B) and D'AOUST (J-Y). Prevention of *Salmonella* infection in chicks by treatment with fecal cultures from mature chickens (Nurmi cultures). *J. Food Prot.* 44(12); 1981; 909-16

TURKEY

- 2961 MORAN (ET) Jr. Cooking characteristics, yields and tissue composition of small white turkeys as affected by back finish grade, sex and strain. *Can. Inst. Food Sci. Technol. J.* 14(3); 1981; 209-13
- 2962 SKLAN (D), TENNE (Z) and BUDOWSKI (P). Simultaneous lipolytic and oxidative changes in turkey meat stored at different temperatures. *J. Sci. Food Agric.* 34(1); 1983; 93-9
 Samples from turkey breast and thigh muscle were taken from freshly slaughtered birds under sterile conditions and stored at 37, 4 or -18 C for up to 24 months. Lipolysis of phospholipids was observed at 37 and at 4 C and to a small extent at -18 C with little change in triglyceride levels. Free fatty acid levels in general increased as phospholipids decreased. Oxodienes and conjugal oxidation products increased with time of storage. KAR
- 2963 JONES (JM), MEAD (GC), GRIFFITHS (NM) and ADAMS (BW). Influence of packaging on microbiological, chemical and sensory changes in chill-stored turkey portions. *Br. Poult. Sci.* 23(1); 1982; 25-40

EGG

- 2964 LEE (DJW), MARTINDALE (L) and PATON (IR). Rapeseed meal and egg tainting: *In vivo* metabolism and excretion of ¹⁴C-trimethylamine by tainter and non-tainter hens. *Br. Poult. Sci.* 23(2); 1982; 175-82
- 2965 JACKSON (PA), SHELTON (CJ) and FRIER (PJ). High-performance liquid chromatographic determination of vitamin D₃ in foods with particular reference to eggs. *Analyst.* 107(1280); 1982; 1363-9
 A high-performance liquid chromatographic (HPLC) method for the determination of vitamin D₂ in foods is described. The method involves addition of vitamin D₂ to the sample as an internal standard followed by saponification and extraction of the unsaponifiable matter. Sterols are removed by precipitation and other interfering compounds by a thin-layer chromatographic clean-up procedure. Vitamins D₂ and D₃ are then separated using reversed-phase HPLC. Details of the accuracy and precision of the method are presented. This method has been applied successfully to the determination of vitamin D₃ in eggs, butter, milk and cheese. AA

SEAFOODS

FISH

- 2966 GOVINDAN (TK). Fresh fish distribution in India: code of conduct called for. *Seafood Export J.* 14(6); 1982; 15-8
 Author has suggested methods to improve the current fresh fish trade in India by paying attention to care on board, icing and storage, hygiene on board, and by proper packing, transportation and marketing including observing proper cleaning schedule at all levels of fish handling and marketing. KMD

- 2967 SRIPATHY (NV). Non-traditional fish by-products an approach to utilisation of low price marine fish. *Seafood Export J.* 14(6); 1982; 23-6
Available methods have been reviewed for the utilization of miscellaneous types of fish caught by trawlers. Various products suggested include fish flour, fish macaroni, dried press cake mince, protein hydrolysates, pickled meat, frozen, breaded ready-to-fry products, and dried, salted fish minces. KMD
- 2968 TULSNER (M) and ROMMINGER (G). Material changes of fish and meat (muscle tissue) as basis of processing into foodstuffs Parts I, II and III. *Lebensmittelindustrie.* 28(1)(2)(3); 1981; 25-29; 78-84; 131-134
The methods of meat and fish processing are characterized by a great number of biological processes, and biochemical, chemical, and physical reactions. In this tripartite contribution a critical summary of the present status of knowledge of such reactions is given. In this connection the technological properties such as power of retaining water, emulsifying capacity, rheological properties of raw materials are dealt with in the first part. In the second part, the deciding reactions of material conversion by the unit operations employed in processing are explained. Enzymatic decomposition of peptide chain, denaturization, by increasing the ion concentration, fatty acids, formaldehydes, and thermal energy covalent reactions are some of these reactions. KMD
- 2969 MOODIE(IM), COLLIER (GS), BURGER (JA) and WERB (BC). An improved method based on gas chromatography for determining the amino acid composition of commercially produced fish-meal. *J. Sci. Food Agric.* 33(4); 1982; 345-54
The development and refinement of a technique based on gas chromatography, for the amino acid analysis of fish meal are described. KAR
- 2970 MCMEEKIN (TA), HULSE (L) and BREMNER (HA). Spoilage association of vacuum packed sand flathead (*Platycephalus bassensis*) fillets. *Food Technol. Aust.* 34(6); 1982; 278, 280-82
The spoilage association of vacuum packed sand flathead fillets was dominated by *Alteromonas* spp. and shelflife was not significantly greater than that of aerobic controls. Attempts to induce development of lactic acid bacteria by reduction in pH or addition of glucose were unsuccessful. The treatments reduced the contribution of *Alteromonas* spp. to the spoilage association with a proportionate increase in *Enterobacteriaceae*. AA.
- 2971 LUCKAS (B) and LORENZEN (W). Presence of chloro-organic pesticides and polychlorinated biphenyls in sea animals from the coasts of Schleswig-Holstein. *Dtsch. Lebensmittel-Rundschau.* 77(12); 1981; 437-41 (German)
403 samples of sea animals from the coasts of Schleswig-Holstein were analyzed with regard to chlorinated hydrocarbons. Lindane and DDT were detected in the samples in very low concentrations only: hexachlorobenzene, α -hexachlorocyclohexane and polychlorinated biphenyls, however, were present in higher concentrations. The highest load of chlorinated hydrocarbons was found to be in cod liver and sea gull eggs. On the average, the tolerances laid down in the "Directive on maximum amounts in animal foodstuffs" for HCB, HCH isomers, lindane and DDT were however, not exceeded. Samples originating from the Baltic Sea were on an average, more heavily contaminated than those from the North Sea. One shortcoming, it was felt is the fact, that no maximum amounts have been established by law for PCB. AA

- 2972 BINTA (GM), TJABERG (TB), NYAGA (PN) and VALLAND (M). Market fish hygiene in Kenya. *J. Hyg.* 89(1); 1982; 47-52

Vibrio parahaemolyticus was isolated from 53 out of 584 samples (9.1%) of market fish. The distribution of this microflora and the other fish spoilage microflora recovered are also listed along with the counts. KAR

ANCHOVY

- 2973 PIRAZZOLI (P), BALDRATI (G), INCERTI (I) and AMBROGGI (F). Processing Technology of Anchovies. III. Influence of temperature on the ripening of salted anchovies. *Ind. Conserve.* 56(2); 1981; 77-81 (Italian)

The effect of three different temperatures (18, 20 and 42 C) on the ripening of salted anchovies was studied. Maturation was slow at 18 C, but followed a normal course, and yielded a product with good organoleptic properties. At the two higher temperatures, the rate of proteolysis increased considerably, but deep changes occurred in the muscle tissues; these changes affected the marketability of the final product (loss of texture, loss of typical flavour and taste). KMD

TROUT

- 2974 BORDERIAS (AJ), MORAL (A) and TEJADA (M). Stability of whole, filleted, and minced trout (*Salmo irideus* Gibb.) during frozen storage. *J. Food Biochem.* 6(3); 1982; 187-95

SEA BREAM

- 2975 CURRAN (CA), NICOLAIDES (L), POULTER (RG) and PONS (J). Spoilage of fish from Hong Kong at different storage temperatures. I. Quality changes in gold-lined sea bream (*Rhabdosargus sarba*) during storage at 0 (in ice) and 10 C. *Trop. Sci.* 22(4); 1980; 367-82

The relative shelf life and spoilage rates of gold-lined sea bream (*Rhabdosargus sarba* Forsskal) from Hong Kong at 0 (in ice) and 10 C were determined. Taste panel results suggest a shelf life of up to 1 month in ice and approximately 5-6 days at 10 C for this species; the rate of spoilage at 10 C, therefore, approximately five times greater than at 0 C. Of the tests used to monitor the changes in quality which occurred during storage, hypoxanthine concentration showed the greatest potential as a quality control index for this species. AA

HAKE

- 2976 BARASSI (CA), CRUPKIN (M), MARTONE (CB) and TRUCCO (RE). Seasonal variation in the viscosity of the extracts of muscle proteins of hake (*Merluccius hubbsi*) stored on ice. *J. Sci. Food Agric.* 33(3); 1982; 303-5

A rapid fall in the viscosity occurs in extracts of fish caught during summer. The viscosity declines at a slower rate after the sixth day of storage for those fish caught during autumn. No change in the viscosity was observed in hake caught during the winter and spring. KAR

HADDOCK

- 2977 REGENSTEIN (JM). The shelf-life extension of haddock in carbon dioxide-oxygen atmospheres with and without potassium sorbate. *J. Food Qual.* 5(4) 1982; 285-300

Fresh haddock, whole fish or fillets, treated or not with various potassium sorbate dips, were sealed in gas impermeable bags containing gas atmospheres of 60% CO₂, 20% O₂ and 20% N₂, air or vacuum, stored on ice in insulated AIRBOX containers at 0 C and subsequently assessed using the Torry freshness scale after 11 to 18 days storage. The trends in the data suggested higher freshness scores for gas and gas plus dip compared with the air and vacuum packs. The dip alone was not effective. It was important to maintain the fish at 0 C. AA

FLAT FISH

- 2978 CATTANEO (P), SONCINI (G), BRENNI (O) and CANTONI (C). Electrophoretic analysis of the proteins of flat fishes and their identification. *Ind. Aliment.* 20(179); 1981; 3-8 (Italian)

Sarcoplasmic proteins of fish extracts were analyzed by cellulose acetate electrophoresis and iso-electrofocussing in thin-layer, polyacrylamide gels. Both these methods can be used for identifying some species of the family *Pleuronectidae*. KMD

SQUID

- 2979 SANTHANA KRISHNAN (G). Dried squid. Part I. A value-added diversified product and its potential export markets. *Seafood Export J.* 14(6); 1982; 9-13

Statistics of the export of frozen squid and cuttlefish from India to Europe in recent years have been reported. Japan is the potential market for the export of Indian dried squid. Ways for trebling the present landings of squid and cuttlefish are suggested. KMD

SHRIMP

- 2980 BECKMAN (I) and MATTSSON (P). Too much water in quick-frozen shrimps. *Var Foda.* 32(10); 1980; 530-32 (Swedish)

An investigation carried out at the Swedish National Food Administration (NFA) shows that too much water or ice often is added to quick-frozen shrimps, either at the freezing process or at packaging. Fresh shrimps contain 42-43% meat compared to 18-34% for quick-frozen shrimps. The quick-freezing process itself does not change the water or ice content very much. The small difference in the dry matter content may depend on the salt-concentration in the shrimps. To make it possible for the consumer to calculate the real price, added water or ice should be declared. AA

MUSSEL

- 2981 CALCAGNO (L), SECCHI (C), BIONDI (PA) and BERRINI (A). Freeze-dried sea foods: A study on "Venus gallina" by isoelectric focussing. *Ind. Aliment.* 20(179); 1981; 15-8 (Italian)

The soluble proteins of the common, Adriatic sea mussel (*Venus gallina*) have been studied by the method of isoelectric focussing, both before and after freeze-drying. The method is capable of bringing to light subtle differences caused by freeze-drying, even after prolonged storage of the freeze-dried product. KMD

PROTEIN FOODS

Nil

FRUIT JUICES AND BEVERAGES

- 2982 GENTH (H). The use of dimethyl dicarbonate as a preservative in soft drinks. *IFST Proc.* 15(2); 1982; 64-70

The side reactions, toxicology, antimicrobial effect and uses have been covered with a final conclusion that in sweet, soft drinks dimethyl carbonate acts against a series of fermentative organisms and other microbes harmful to beverages when added to those in amounts upwards of only 40 ppm and that, having exerted its action it ceases to exist in the beverage. KAR

- 2983 HENKEL (M). Utilization of the pomace of stone and soft fruits as fuel. *Lebensmittelindustrie.* 28(1); 1981; 17-8 (German)

The pomace from pressing of stone and soft fruits in the juice industry is at present hardly used. So the calorific effect and other values of the fuel quality are ascertained by a method explained in the article. The application of the pomace is proposed as a blend with other solid fuels, with raw lignite especially, either for immediate combustion, or for manufacture of pulverized fuel. AA

FRUIT JUICE

- 2984 WEISSEN BACH (MJ). Questions of energy saving measures in the fruit juice industry. *Flussiges Obst.* 47(12); 1980; 582-8 (German)

PINEAPPLE

- 2985 ARDESHIR (J), KACKER (R) and DAS (H). Extraction characteristics of pineapple juice. *J. Agric. Eng.* 19(4); 1982; 91-4

A ram and cylinder type load cell was used for studying extraction characteristics of pineapple juice. Results from the experiments showed that the relationship between log pressure and bulk specific volume of the press cake is linear until the beginning of juice outflow and is non-linear beyond this region. At lower values of cake height the volume rate

of juice outflow becomes directly proportional to the rate of ram movement and the cumulative volume of juice outflow becomes directly proportional to the decrease in cake height. Within the range of experimentation, the juice outflow during the relaxation process varied between 9 to 17% of the expressible juice in the material. AA

GRAPE

- 2986 WELCH (RC), JOHNSTON (JC) and HUNTER (GLK). Volatile constituents of the muscadine grape (*Vitis rotundifolia*). *J. Agric. Food Chem.* 30(4); 1982; 681-4

The volatile constituents of the muscadine grape have been studied by the combined technique of gas chromatography and mass spectroscopy. Forty-nine compounds have been identified and confirmed. AA

CITRUS

- 2987 SHAW (PE) and WILSON (CW). Volatile sulphides in headspace gases of fresh and processed citrus juices. *J. Agric. Food Chem.* 30(4); 1982; 685-8

Hydrogen sulphide was present in parts per million in headspace gases above fresh oranges, grapefruit, tangerine, lemon, lime, tangelo, and tangor juices. Variations were studied in hydrogen sulphide content as related to time after juice extraction and the harvesting season. The most significant changes were found after fruit had been freeze-damaged. Traces of other volatile sulphur compounds present in a few fresh juices were tentatively identified as dimethyl sulphide, methanethiol, and dimethyl disulphide. No hydrogen sulphide was detected in processed juices, but dimethyl sulphide was found in canned orange and grapefruit juices and glass-packed orange juice. On the basis of the amounts present, hydrogen sulphide is probably important to aroma of fresh juices, and dimethyl sulphide is probably important to both aroma and off-flavour of some processed juices. AA

GRAPEFRUIT

- 2988 JOHNSON (RL) and CHANDLER (BV). Reduction of bitterness and acidity in grapefruit juice by adsorptive processes. *J. Sci. Food Agric.* 33(3); 1982; 287-93

By choosing an appropriate adsorbent, (Amberlite XAD-7 or Deacidite-FFIP) the bitter principles (naringin and limonin) and titratable acids could be removed from grapefruit juice in varying combinations. KAR

ORANGE

- 2989 GASQUE (F), PEREZ (R), LAFUENTE (B) and NAVARRO (JL). Influence of head space composition of the quality retention of concentrated orange juice in refrigerated storage. *Rev. Agroquim. Tecnol. Aliment.* 21(1); 1981 131-6

This study was carried out to determine the effect of head space volume (20,40 and 80%) and its composition (air or nitrogen) on the

stability of concentrated orange juice (60° Brix) during refrigerated storage 9(0-2 C). Quality parameters considered were: hunter colour, hydroxymethyl furfural, browning as measured by optical density, ascorbic acid retention and organoleptic evaluation. When head space volume was upto 20% its composition did not affect the quality of the product during 10-month storage. For higher head space volumes it is recommended to keep the juice under nitrogen atmosphere in order to improve the ascorbic acid retention and to prevent the loss of organoleptic acceptance. AA

BEVERAGES

- 2990 HUGHES (S) and JOHNSON (DC). High-performance liquid chromatographic separation with triple-pulse amperometric detection of carbohydrates in beverages. *J. Agric. Food Chem.* 30(4); 1982; 712-4
A new amperometric technique was applied at a miniature platinum electrode in a flow-through electrochemical detector for the chromatographic determination of several carbohydrates in selected samples of beverages. Detection limits for dextrose were approximately 4.6 µg/mL in a 100-µL sample, which is more than 100X lower than that reported for conventional refractive index detection. AA
- 2991 JURGENS(U). High pressure liquid chromatographical analysis of flavours. II. Investigation of essence syrups and beverages as well as vanilla and vanillin sugars in small packages. *Dtsch. Lebensmittel-Rundschau.* 77(6); 1981; 211-3 (German)
To investigate essence syrups and beverages with regard to their content of coumarin or quinine, conditions for high pressure liquid chromatography are described. For the examination of vanilla and vanillin sugars in small packages, an analytic procedure is presented allowing for easy computation of the vanillin content in each individual package. It is also suggested that there should be a minimum content of 5 mg of vanillin in each small package of vanilla sugar. AA

TEA

- 2992 ULLAH (MR) and ROY (PC). Effect of withering on the polyphenol oxidase level in the tea leaf. *J. Sci. Food Agric.* 33(5); 1982; 492-5
The level of polyphenol oxidase in tea leaf (*Camellia sinensis*) decreased on partial desiccation of the leaf during the withering process of black tea manufacture. However, sufficient activity remained, even after withering, to oxidise the available substrate in the leaf. The loss in activity due to desiccation was restored on rehydration. AA

COFFEE

- 2993 ADAMS (MR) and DOUGAN (J). Biological management of coffee processing wastes. *Trop. Sci.* 23(3); 1981; 177-96
- 2994 RADTKE-GRANZER (R) and PIRINGER (O-G). Problems in the quality evaluation of roasted coffee through quantitative trace analysis of volatile flavour components. *Dtsch. Lebensmittel-Rundschau.* 77(6); 1981; 203-10 (German)

A GC/MS method of quantitative analysis of volatile substances in roasted coffee is described. The measured sum of the absolute concentrations of 2-methyl propanal, 3-methyl butanal, diacetyl and 2-methyl furan in the most common commercial brand of coffee in West Germany amounted to 110 ± 21 mg/kg. A decreasing of the values below 89 mg/kg during the storage under different conditions always correlated with a sensory score of less than 5.5 on the 9 step scale. AA

- 2995 REID (S) and GOOD (TJ). Use of chromatographic mode sequencing for sample preparation in the analysis of caffeine and theobromine from beverages. *J. Agric. Food Chem.* 30(4); 1982; 775-8

Several bonded-phase sorbents in combination with the effect of several different elution solvents have been evaluated for use in the sample preparation segment of xanthine analyses in beverages. Xanthines are isolated from beverages including coffee, tea, cocoa, and colas in a rapid and highly selective procedure using solid-phase sample preparation, i.e., the use of surface-modified sorbents coupled to the technique of chromatographic mode sequencing. The resultant procedure utilizes Bond Elut columns packed with C₁₈ bonded silica (Analytichem International). Average recovery values for the three xanthines ranged from 92% to 98% with coefficients of variation of less than 5% for all three compounds. The caffeine and theobromine levels in several different brands of coffee, tea, and soft drinks were determined by using the described procedure, and the values obtained compared well with those reported by other investigators. AA

- 2996 CHAUDHURI (MM) and GHOSH (S). Effect of caffeine on macromolecular synthesis in Sarcoma-180 Mouse ascites cells. *Indian J. Exp. Biol.* 20(6); 1982; 433-6

The effect of caffeine on nucleic acids and protein has been shown to be dose-dependent. This would explain the conflicting views expressed by different authors. The inhibition of incorporation of radioactive precursors into DNA, RNA, and proteins can be first observed at a dose of 50 mg caffeine per kg body weight, and strong inhibition was observed at a dose of 150 mg/kg body weight. The inhibitory effect of caffeine on the synthetic processes of mouse ascites cells could be restored by incubating the treated cells in a caffeine-free medium; hence, the caffeine-DNA interaction is, possibly, a physical process. Lethality of the higher doses of caffeine may be due to increased DNA breakdown due to a concomittant increase in intranuclear DNase activity. KMD

COCOA

- 2997 ROEBERS (Th). Cocoa products and CBA's. *Manuf. Confect.* 61(10); 1981; 47-50
- 2998 BAUERMEISTER (P). Cocoa liquor roasting. *Manuf. Confect.* 61(10); 1981; 43-5

WINE

- 2999 MON (PR). Effect of nitrogen and vitamin supplements on yeast growth and rate of fermentation of Rhine Riesling grape juice. *Food Technol. Aust.* 34(7); 1982; 328-32
- Wine yeast was supplemented with either diammonium phosphate, glutamic acid, amino acids and vitamins. The control and enriched juice samples are supported a similar exponential growth rate by the yeast at 15 C for the first 40 to 50 hour. Further, yeast growth was linear in all fermentations, but the rate varied considerably between the different supplements; there was no response to vitamin addition. The linear growth rate in juices enriched with available nitrogen was stimulated by 40 to 300%. The addition of diammonium phosphate or an amino acid mixture significantly reduced the hydrogen sulphide accumulated for each gram of yeast protein synthesised during linear growth. KAR
- 3000 BURKHARDT (R). Astringents and taste nuances in grapes, must and wine. *Dtsch. Lebensmittel-Rundschau.* 77(11); 1981; 400-403
- Description, definition, and prediction of astringency, i.e. the tanning capacity vis-a-vis the oral mucus membrane on consumption of fruits, fruit mashes, and wines are beset with great difficulty because the phenolic compounds which are the root cause of astringency are present in all possible forms - genuine solutions, colloids, and crude dispersions - and their transitions, and are continually undergoing alterations from one form to another. This occurs during the manufacturing process, as well as during clarification and ageing of the beverages. Enzymatic influences of microbial origin, when subjected to wine, making techniques, produce an unfavourable alteration in the factors that affect the enjoyability, odour, and taste favourably, and accelerate the ageing processes. KMD
- 3001 ANDRE (P), BENARD (P), FLANZY (C) and TACCHINI (M). Wine-making by carbonic maceration. Evolution of free and bound aminoacids present in must and wine. *Sci. Aliment.* 1(1); 1981; 27-53 (French)
- The composition of free run wine and of blends of (free run wine) + (press wine) was studied during wine-making by the carbonic maceration process; the parameters measured were total nitrogen, ammoniacal nitrogen, free aminoacids, and aminoacids in the form of peptides and of proteins. The product obtained by an anaerobic metabolism of grapes is fundamentally transformed by micro-organisms. Peptidic and free aminoacids are strongly catabolized. Protein modifications seem to occur. A thorough knowledge of these phenomena should lead to a better control over the microbial fermentations during carbonic maceration. KMD
- 3002 EDWARDS (M), ESCHENBRUCH (R) and MOLAN (PC). Foaming in winemaking. I. A technique for the measurement of foaming in winemaking. *European J. Appl. Microbiol. Biotechnol.* 16(2-3); 1982; 105-9
- In this study, a linear relationship was established between the foaminess of bovine serum albumin solutions and its concentration between the foaminess of fermented artificial medium and its concentration and between the foaminess and the rate of sparging of gas. Measurements were also made of the foaminess of some finished wines. KAR

- 3003 MOLAN (PC), EDWARDS (M) and ESCHENBRUCH (R). Foaming in winemaking. II. Separation and partial characterisation of foam-inducing proteins excreted by a pure culture wine yeast. *European J. Appl. Microbiol. Biotechnol.* 16(2-3); 1982; 110-13

Yeast cells by themselves caused little foaminess. More than 80% of the foaminess of the supernatant was retained by an ultrafilter of nominal cut-off 10,000 daltons. The foaminess of this was found on chromatography to be due to three peaks of proteinaceous nature with molecular weights around 145×10^3 , 125×10^3 and 100×10^3 . Ethanol at concentration of above 8% reduced foaminess. KAR

BEER

- 3004 BRANDON (H), PELTON (P) and STAACK (G). State-of-the-art methodology for evaluation of pasteurizer heating and cooling processes. *MBAA Tech. Quart.* 19(1); 1982; 34-40
- 3005 GRIFFIN (OT). Clova maltings. A design for maritime climate. *MBAA Tech. Quart.* 19(1); 1982; 41-4
- 3006 KRUGER (L), RYDER (DS), ALCOCK (C) and MURRAY (JP). Malt quality prediction of malt fermentability. Part I. *MBAA Tech. Quart.* 19(1); 1982; 45-51
- 3007 PENALBA (JL) and SOLA (C). Batch fermentation of beer in industrial tanks. II. Evolution of the kinetic parameters along successive yeast generations. *Rev. Agroquim. Tecnol. Aliment.* 21(1); 1981; 100-106 (Spanish)
- The evolution of the kinetic parameters of Monod's model along successive yeast generations has been studied for bath beer fermentation. The correlation of these parameters with the empirical measurement used in practice to determine the number of generations that the same yeast can be reutilized are shown. It is proposed to use the stoichiometric coefficient a (ratio of substrate consumption to cell growth) as a representative parameter to identify the state of the yeast. AA
- 3008 BRANDON (H), STAACK (G), PUSKARZ (S) and KAUFMANN (M). Fluid flow analysis for beer filling valves. *MBAA Tech. Quart.* 19(1); 1982; 1-5
- 3009 OTTER (GE) and MARSH (AS). An alternative method for the determination of dimethyl sulphide in beer. *J. Inst. Brew.* 88(2); 1982; 76-9
- A method for the determination of dimethyl sulphide (DMS) in beer and for total DMS precursor in malt is described. The DMS was extracted into chloroform and determined by glass capillary gas liquid chromatography (GLC) using a flame ionisation detector (FID) and diethyl ether as an internal standard. Errors arising from the use of 'head space' sampling were thereby avoided. The reproducibility of results and the recovery of DMS at the 100 ppb level were satisfactory but less so at levels below 50 ppb. Beers produced in a pilot brewery from malts containing high levels of total DMS precursor were not found to contain correspondingly high levels of DMS. AA
- 3010 DAVIES (NW). Essential oils of Tasmanian grown hops. *J. Inst. Brew.* 88(2); 1982; 80-83

- 3011 QUAIN (DE) and TUBB (RS). The importance of glycogen in brewing yeasts. *MBA Tech. Quart.* 19(1); 1982; 29-33

- 3012 PARKKINEN (E) and SUOMALAINEN (H). Esterases of baker's yeast. III. The ester/acid ratio in model solutions. *J. Inst. Brew.* 88(2); 1982; 98-101

CIDER

- 3013 FOURNIER (H), CHARBONNEAU (R), GAGNON (M) and DUBDIS (G). Deacidifying effect of *Schizosaccharomyces pombe* on Quebec cider. *Sci. Aliment.* 1(1); 1981; 19-25 (French)

Apple juices were inoculated with *Saccharomyces cerevisiae* and/or *Schizosaccharomyces pombe* strains, to compare their effect on the acidity of Quebec cider. The pH of the apple must, initially 3.4, rose to 5.0 after inoculation with *Schizosaccharomyces pombe*. The musts inoculated with both the micro-organisms gave a cider which had good properties of both the strains; viz. a good percentage of alcohol due to the first, and a reduction in acidity due to the second. KMD

WHISKEY

- 3014 QUINN (JP), BARKER (TW) and MARCHANT (R). Soluble complexes of copper and zinc in whiskey distillery spent wash. *J. Inst. Brew.* 88(2); 1982; 95-7

OILS AND FATS

- 3015 WESSELS (H). Development of new codex standards for oils and fats. *Fette Seifen Anstrichm.* 83(2); 1981; 82-4

- 3016 De RIJKE (D), TER HEIDE (R) and BOELEN (H). New compounds with small rings in essential oils. *Perfum. Flavor.* 7(1); 1982; 31-7

- 3017 LAWRENCE (BM). Progress in essential oils. *Perfum. Flavor.* 7(1); 1982; 45-50
Discusses: Roman cassie oil; citronella oil; clove oil; cypress oil; ginger oil; olibabum oil; and turmeric oil. BSN

- 3018 SULEKHA MUKYOPADHYAY and BHATTACHARYYA (DK). Detection of Kusum oil. *J. Oil Technol. Assoc. India.* 14(2); 1982; 56

The presence of Kusum oil (*Schleichera trijuga*) in mustard oil or rapeseed oil detected by the Cu acetate/benzidine acetate method and the picric acid method could enable one to detect the presence of 0.1% of kusum oil in edible oils, while the ferric chloride method fails to detect kusum oil at levels below 0.5%. The picric acid test gives the most certain results; but this test requires a considerably greater quantity of oil than the Cu-acetate/benzidine-acetate test. KMD

- 3019 MUNCH (EW). Technology of the crystallisation and pulverisation of fats and fat like substances. *Gordian.* 81(4); 1981; 74-80 (German)

- 3020 RICHTER (Von H). Flotation: A useful procedure for treatment of oil and fat containing waste water *Fette Seifen. Anstrichm.* 83(1); 1981; 10-7 (German)
- 3021 BEZARD (J), SEMPORE (G), DESCARGUES (G) and SAWADOGO (A). Further studies on the determination of the 2-isomers of triglycerides from natural fats. *Fette Seifen. Anstrichm.* 83(1); 1981; 17-23
- 3022 LIEBING (H) and LAU (J). A new design of the stripping stage in miscella distillation. *Fette Seifen. Anstrichm.* 83(1); 1981; 23-7 (German)
- 3023 ZAJIC (J), SOUKVP (J) and BARES (M). Investigations of the continuous hydrogenation of oils and fatty acids. I. Course of raw material exchange. *Fette Seifen. Anstrichm.* 83(2); 1981; 55-7 (German)
- 3024 NASNER (A) and KRAUS (LJ). Quantitative determination of phosphatidyl choline by means of HPLC. *Fette Seifen Anstrichm.* 83(2); 1981; 70-3 (German)
 A HPLC method for a rapid determination of phosphatidyl choline in soyabean lecithine is described. The separation was carried out on Lichrosorb 1 60. The detection took place at 206 nm. Comparing this method with the results of the choline determination by Reineckat precipitation and by statistical evaluation, it could be significantly established that the HPLC method (variation coefficient 1.1) is superior to the Reineckat method (variation coefficient 2.6). AA
- 3025 KUNDU (MK) and DEB (AT). Column chromatographic determination of unsaponifiable matter in fats and oils. *Fette Seifen. Anstrichm.* 83(2); 1981; 73-6
 A column chromatographic method for determination of unsaponifiable matter (UM) in fats and oils has been developed. The procedure involves saponification of the oil and elution of UM through a mixed bed consisting of an upper layer of calcium oxide and a lower layer of basic aluminium oxide, using diethyl ether as the eluting solvent, and finally quantitation of UM by weight. The method eliminates tedious and time-consuming extraction steps, and the consequent problems due to possible emulsion by hydrolysis. UM contents of fats and oils can be determined with very good to excellent accuracy. The relative standard deviation for 6.0 percent to 0.5 percent of UM in oils is in the range of 0.5-2.0. AA
- 3026 NICOLAS (J) and DRAPRON (R). Plant lipxygenases. Present state of our knowledge. I. Biochemical aspects. *Sci. Aliment.* 1(1); 1981; 91-168
 The aspects covered in this review are: (1) methods of assay and detection of lipxygenase activity; (2) different sources and localization of the activity; (3) isolation techniques and the purification obtained; (4) physico-chemical characteristics of the purified lipxygenases; (5) substrates of lipxygenase, and primary products of the enzymatic reaction; (6) kinetic aspects of the different reaction mechanisms proposed for the aerobic and anaerobic reactions; (7) pH and temperature effects; (8) action of different effectors on lipxygenase activity; (9) co-oxidation phenomena; (10) secondary reactions of the lipxygenase and the enzymes acting on the hydroperoxides; and (11) physiological role of lipxygenase in lipid metabolism. KMD

- 3027 KHEOK (SC) and LIM (EE). Mechanism of palm oil bleaching by montmorillonite clay activated at various acid concentrations. *J. Am. Oil. Chem. Soc.* 59(3); 1982; 129-31

The mechanism of bleaching by a nonswelling montmorillonite clay activated at various acid concentrations was studied in the bleaching of palm oil. Montmorillonite clay was activated by 2 parts of H_2SO_4 at concentrations of 10-40%. Chemical composition, bleaching ability, specific surface area and phosphorus content were studied. The study showed that an initial increase in bleaching ability by clay activated by an increasing addition of H_2SO_4 was due to acid leaching of organic matter and impurities in the clay. The consequence of acid leaching in this case tends to expose active sites for adsorption. Acid leaching also removed Al^{3+} , causing charge deficiency in the clay lattice and, hence, promoting the adsorption properties of the clay. A drop in bleaching efficiency at higher additions of H_2SO_4 was observed. This was due to excessive acid leaching of Al^{3+} , causing collapse of the clay lattice structure. AA

SPICES AND CONDIMENTS

- 3028 DAFFERTSHOFER (G). The art of aromatization. *Gordian*. 81(4); 1981; 71-3 (German)
- 3029 HERRMANN (K), SCHUTTE (M), MULLER (H) and DISMER (R). On the anti-oxidant effect of spices. *Dtsch. Lebensmittel-Rundschau*. 77(4); 1981; 134-9 (German)

PEPPER

- 3030 MATHAI (CK). Accumulation pattern of oleoresin and related chemical constituents in black pepper (*Piper nigrum*) berries during growth and development. *Qualitas Plantarum*. 31(1); 1981; 3-10

CLOVE

- 3031 NICOLLIER (GF) and THOMPSON (AC). Phytotoxic compounds from *Melilotus alba* (White sweet clover) and isolation and identification of two new flavonoids. *J. Agric. Food Chem.* 30(4); 1982; 760-64

SENSORY EVALUATION

- 3032 COSTELL (E) and DURAN (L). Sensory analysis in the quality control of foods. I. Introduction. *Rev. Agroquim. Tecnol. Aliment.* 21(1); 1981; 1-10 (Spanish)

The authors have outlined the role of sensory analysis in the quality control of foods. It is indispensable when one is trying to establish which parameter or parameters of food quality have to be measured routinely with the help of instruments. KMD

- 3033 COSTELL (E) and DURAN (L). Sensory analysis in the quality control of foods. II. Design and planning - Selection of test. *Rev. g. quim. Technol. Aliment.* 21(2); 1981; 149-66 (Spanish)

Sensory testing methods that are being applied widely have been described; the usefulness of each test, and the type of information, it can provide, have been mentioned. KMD

- 3034 Van de VOORT (FR), MILLER (H) and ASHTON (GC). Automated reading and recording of sensory data for semi-structured scales. *Can. Inst. Food Sci. Technol. J.* 14(3); 1981; 220-23

The use of Optical Mark Reader (OMR) cards is proposed, explained and tested as a potential substitute for the conventional semi-structured scale used in sensory evaluation. The use of OMR cards allows the direct transfer of data from the panelist to the computer, bypassing the tedious measuring, recording and data entry steps normally required. Statistical assessment of the OMR method in relation to the semi-structured approach indicates that comparable results can be obtained. AA

- 3035 NEUMANN (R) and ECKERT (B). Reliability of the results of sensory analysis. 2. Ascertainment of the fidelity of judgement of the individual investigators. *Lebensmittelindustrie.* 28(1); 1981; 7-11 (German)

At first the point scale method, prevalent in food industry is characterized. Then the methods for determining the fidelity of judgement of investigators have been discussed. The application of indices, such as index of reproducibility, enables one to know the weakness of the individual investigator, and to take up corrective measures. KMD

- 3036 SCOTT (TR) and PRITCHARD (TC). A neurobehavioural analysis of 1-amino acids as taste stimuli. *Perfum. Flavor.* 7(1); 1982; 1-25

Discusses: chorda tympani multi unit responses to amino acids; taste preferences; the neutral coding of amino acid taste quality; taste quality and behavioural responses. BSN

- 3037 HOPPE (K). Contributions to the psychophysics of the sweet taste. Part 2. A statistical theory of the stimulus-response behaviour of the sweet-taste-receptors. *Nahrung.* 25(2); 1981; 151-65 (German)

The Weber concentration difference threshold has been determined for the sweet taste. The following differential equation has been formulated for the stimulus - response behaviour of sucrose: $\frac{dR}{dS} = b(1-R/R_m)$,

on integration, it becomes $R(S) = R_m (1 - e^{-b \cdot S/R_m})$, where S is the concentration of the sugar solution, R the successful stimulus in steps, R_m is the maximum value of R, and b a parameter which indicates the maximal probability of a successful stimulus. KMD

FOOD STORAGE

- 3038 NEWELL (GJ). A new shelf-life failure model. *J. Food Prot.* 44(8); 1980; 580

A new statistical model for shelf-life failure is proposed. This model is based on consideration of the basic physical characteristics of the shelf-life failure process rather than adhoc reasons such as goodness-of-fit tests. AA

INFESTATION CONTROL AND PESTICIDES

- 3039 FREKE (CD) and HAGGIE (D). Improved bactericidal efficiency of an acidic quaternary ammonium compound with increasing temperature. *J. Food Prot.* 44(9); 1981; 699-700

The bactericidal efficiency of an acidic quaternary ammonium compound (QAC) was examined over a temperature range of 20-55 C. The efficiency increased from no detectable kill in 1 minute at 20 C to a 5-decimal reduction in 1 minute at 55 C. It is recommended that temperature be taken into account when assessing the efficiency of disinfectants. AA

- 3040 MOLINARI (F). Test of the efficacy of propetamphos against the cockroach. *Ind. Aliment.* 20(182); 1981; 276-9 (Italian)

The insecticidal activity of propetamphos (1.18 g/m²) against cockroaches (*Blatta orientalis*, *Blattella germanica*) has been compared with that of propoxun (1.1 g/m²) and bendiocarb (0.38 g/m²). The action of propetamphos was slightly slower than that of propoxun, but equally effective in the long run. Both these products caused the death of all exposed individuals, while the reactions to bendiocarb have been less regular. Practical applications of propetamphos - a phosphoric ester, viz: ((E)-O-2-isopropoxycarbonyl-1-methyl-vinyl-O-methyl-ethyl phosphoramidothioate) - in inhabited buildings have confirmed the results achieved in the laboratory tests. KMD

- 3041 BANDYOPADHYAY (R). Inhibition of acetylcholine esterase by permethrin, and its reversion by acetylthiocholine. *Indian J. Exp. Biol.* 20(6); 1982; 488-91

Permethrin, a pyrethroid insecticide, was found to inhibit acetylcholine esterase (A Ch E) of rat brain cortex both under *in vitro* and under *in vivo* conditions. The *in vitro* inhibition was fully reversed when the substrate was used at a concentration higher than the K_m value. The *in vivo* inhibitory effect could be reversed within 1 hour, if acetylthiocholine was injected into the animal at a concentration of 1 µg/kg body weight, 30 minutes after injection of the pesticide into the animal. KMD

BIOCHEMISTRY AND NUTRITION

- 3042 THEANDER (O) and AMAN (P). Studies on dietary fibre. A method for the analysis and chemical characterisation of total dietary fibre. *J. Sci. Food Agric.* 33(4); 1982; 340-44

A procedure for the analysis of total dietary fibre (including non-starchy polysaccharides and Klason lignin) is described. The method consists of extraction of homogenised and/or milled foodstuffs with 80% ethanol and chloroform, and analysis of acidic and neutral polysaccharide constituents, starch and Klason lignin in the residue. Uronic acid constituents were determined by a decarboxylation method, neutral sugar constituents as alditol acetates by a gas-liquid chromatographic method, starch by an enzymic method, and Klason lignin gravimetrically. The sum of anhydrosugars, anhydrouronic acids and Klason lignin from which the starch

content is subtracted provides a measure of the total dietary fibre. The method described is reproducible, fairly rapid and gives informative quantitative characterisation of the fibre constituents. AA

- 3043 BOGNAR (A). Determination of riboflavin and thiamine in foodstuffs by means of high pressure liquid chromatography. *Dtsch. Lebensmittel-Rundschau*. 77(12); 1981; 431-6 (German)

A method is described to routinely determine riboflavin and thiamine in foodstuffs through high pressure liquid chromatography and a fluorescence detector. The vitamins are set free from the analyzing material through acid and enzymatic hydrolysis. Riboflavin is separated directly from the solubilization solution on a LiChrosorb NH₂ column with methanol/sodium acetate buffer pH 4.5 (50:50) as the mobile phase, and measured on the fluorescence detector. Thiamine is oxidized into thiochrome and then separated on a LiChrosorb RP8 column with methanol/acetonitrile/isobutanol (80:10:10) as the mobile phase, and measured on the fluorescence detector. Analysis results are well reproducible. The find-back rate was 98 to 103% for riboflavin and 94 to 105% for thiamine, depending on the foodstuff involved. The detection limit of the method is under 5 µg of riboflavin or of thiamine per 100 g of foodstuff. The procedure is relatively easy to handle and hardly susceptible to derangement. AA

- 3044 ROBAIDEK (E). Bioassay methods for nutrients in processed foods. *Food Technol.* 37(1); 1983; 81-83

Article covers how bioassays measure bioavailability; evaluation of protein quality; evaluation of vitamins, and evaluation of minerals; KAR

- 3045 JONSSON (L) and DANIELSSON (K). Vitamin retention in foods handled in food service systems. *Food Sci. + Technol.* 14(2); 1981; 94-6

- 3046 RIVA (M), MANNINO (S) and DAGHETTA (A). Method of expressing and calculating the nutritional quality of foods. *Ind. Aliment.* 20(182); 1981; 251-60 (Italian)

It is proposed that a Nutritional Quality Index (INQ) may be defined as
$$\text{INQ} = \frac{\text{percent standard requirement of nutrient}}{\text{percent standard requirement of energy}}$$

Such an index, calculated by means of a computer program, allows a quantitative and qualitative evaluation of foods, menus, and diets. Some examples of the use of INQ have been reported. KMD

- 3047 TELEGDYKOVATS (L) and BERNDORFER-KRASZNER (E). Reflections on some vitamins and a modern vitaminology. *Nahrung*. 25(2); 1981; 135-42 (German)

Certain aspects of the present state of vitamin research are treated with special regard to a modern interpretation of the concept of vitamin and to questions concerning the utilization of recent findings by the food industry and other sciences. A classification of vitamins according to their solubility and functional properties is discussed. Recent findings on the relationships between tocopherols and tocotrienols and on bioquinones are dealt with. Furthermore, the significance of some vitamin like substances (such as choline, 5-methyl-methionine and pangamic acid) and their biochemical importance are considered. AA

- 3048 COY (JS) and LOWRY (RK). Relationships of birthweight and feeding patterns to subsequent growth in Tasmanian children. *J. Food Nutr.* 38(1); 1981; 1-6

TOXICOLOGY AND HYGIENE

- 3049 PHILIP (JM). Evaluation of the safety of foods. *Proc. Nutr. Soc.* 40(1); 1981; 47-56
- 3050 PARIZA (MW). Carcinogenicity/toxicity testing and the safety of foods. *Food Technol.* 37(1); 1983; 84-6
 After defining the various terms and concepts, the author puts forth as to how the problems are identified, how the tests are evaluated, and how the data are applied. KAR
- 3051 SCHRAMM (T) and TEICHMANN (B). Screening of chemical compounds and test for cancerogenic properties - Components of a comprehensive, toxicological testing procedure. *Nahrung.* 25(2); 1981; 167-73 (German)
 Screening (short-term tests) of chemical compounds helps to identify and select those chemicals which have to be subsequently tested in long-term animal experiments. Experiments of the latter type are the only known way of recognizing possible cancerogenic risks to humans. Every compound which produces tumours in animals must be regarded as cancerogenic, and differentiation between compounds that are cancerogenic in animals and in humans respectively, is not justified, and should be avoided. In some cases it may be necessary to balance the benefits against the risks, and arrive at a specific realistic decision. KMD
- 3052 MULLER (H) and SIEPE (V). Quantitative determination of arsenic, lead, cadmium, mercury and selenium in foodstuffs by means of flameless atomic absorption spectrometry. *Dtsch. Lebensmittel-Rundschau.* 77(11); 1981; 392-400 (German)
 For the determination of contaminants in foods an apparatus was developed for wet-ashing under controlled conditions. The elements arsenic, lead, cadmium, mercury and selenium were extracted from the acid solutions as DADDTc complexes with xylene or chloroform and determined by means of the flameless atomic absorption spectrometry (atomization in the graphite tube). The efficiency of the method has been demonstrated by examples. AA
- 3053 ENGST (R), BECKMANN (G), LAUTERBACH (K) and KONIG (R). Investigations on the contamination of foods and feeds from selected regions of the Erfurt district with lead and cadmium. Part 2. The load of heavy metals on agricultural plant products in the area of a lead emitter and in a control area. *Nahrung.* 25(2); 1981; 175-84 (German)
 Using the inverse voltammetric method described in Part 1, the authors have determined Pb and Cd contents in 126 samples of forage and 86 samples of cereals. 20 out of 87 forage samples from an area surrounding a lead emitter had more than 10 mg Pb/kg of dry matter; 11 out of 55 cereal samples contained more than 0.5 mg Pb/kg of fresh matter. There was no correlation between the Cd values and the Pb values. KMD
- 3054 HOLLSTEIN (E), LAUE (W) and ZAPFF (G). Gas-chromatographic determination of chloramphenicol residues in animal material. *Nahrung.* 25(2); 1981; 143-9 (German)
 Authors describe extraction, cleaning and derivatization procedures for the determination of chloramphenicol in milk, muscular substance, urine and bile. Chloramphenicol was determined as bis-(trimethylsilyl)-

ether using a gas chromatography fitted with an electron capture detector. To evaluate the analytical techniques, the authors estimated the sensitivity, accuracy and precision for residue amounts of 0.1 and 0.05 mg of chloramphenicol/kg of material under investigation. The limit of detection was 0.02 mg/kg for meat, and 0.01 mg/kg for milk, urine and bile. AA

- 3055 ALLCOCK (ER), REID (SJ), JONES (DT) and WOODS (DR). Autolytic activity and an autolysis-deficient mutant of *Clostridium acetobutylicum*. *Appl. Environ. Microbiol.* 42(6); 1981; 929-35
- 3056 LEWIS (GE) Jr., KULINSKI (SS), REICHARD (DW) and METZGER (JF). Detection of *Clostridium botulinum* type G toxin by enzyme-linked immunosorbent assay. *Appl. Environ. Microbiol.* 42(6); 1981; 1018-22
- 3057 FERREIRA (JL), HAMDY (MK), ZAPATKA (FA) and HEBERT (WO). Immunodiffusion method for detection of type A *Clostridium botulinum*. *Appl. Environ. Microbiol.* 42(6); 1981; 1057-61
- 3058 BABAJIMOPOULOS (M) and MIKOLAJCIK (EM). Heat inactivation and reactivation of alpha toxin from *Clostridium perfringens*. *J. Food Prot.* 44(12); 1981; 899-902
- 3059 SANDERS (ME) and KLAENHAMMER (TR). Evidence for plasmid linkage of restriction and modification in *Streptococcus cremoris* KH. *Appl. Environ. Microbiol.* 42(6); 1981; 944-50
- 3060 STERSKY (A), BLANCHFIELD (B), THACKER (C) and PIVNICK (H). Reduction of *Salmonella* excretion into drinking water following treatment of chicks with nurmi culture. *J. Food Prot.* 44(12); 1981; 917-20
- 3061 CIEGLER (A). Do mycotoxins function in ecological processes? *J. Food Safety.* 5(1); 1983; 23-30
- 3062 WATSON (DH) and LINDSAY (DG). A critical review of biological methods for the detection of fungal toxins in foods and foodstuffs. *J. Sci. Food Agric.* 33(1); 1982; 59-67
- 3063 DAVIS (ND). Sterigmatocystin and other mycotoxins produced by *Aspergillus* species. *J. Food Prot.* 44(9); 1981; 711-4, 722
- 3064 BULLERMAN (LB) and BUCHANAN (RL). Mycotoxins other than aflatoxins. Their relationships to food safety. *J. Food Prot.* 44(9); 1981; 701-710
- 3065 PESTKA (JJ), BEERY (JT) and CHU (FS). Indirect immunoperoxidase localization of aflatoxin B₁ in rat liver. *Food Chem. Toxicol.* 21(1); 1983; 41-8
- 3066 DELUCCA (AJ), DUNN (JJ), LEE (LS) and CIEGLER (A). Toxicity, mutagenicity and teratogenicity of brevianamide, viomellein and xanthomegnin: Secondary metabolites of *Penicillium viridicatum*. *J. Food Safety.* 4(3); 1982; 165-8
- 3067 MISLIVEC (PB). Toxic species of *Penicillium* common in food. *J. Food Prot.* 44(9); 1981; 723-6

- 3068 STORMER (FC), HANSEN (CE), PEDERSEN (JI), HVISTENDAHI (G) and AASEN (AJ). Formation of (4R) - and (4S)-4-hydroxyochratoxin A from ochratoxin A by liver microsomes from various species. *Appl. Environ. Microbiol.* 42(6); 1981; 1051-6
- 3069 MIROCHA (CJ) and SWANSON (SP). Regulation of perithecia production in *Fusarium roseum* by zearalenone. *J. Food Safety.* 5(1); 1983; 41-53
- 3070 VESONDER (RF), ELLIS (JJ) and ROHWEDDER (WK). Elaboration of vomitoxin and zearalenone by *Fusarium* isolates and the biological activity of *Fusarium* produced toxins. *Appl. Environ. Microbiol.* 42(6); 1981; 1132-4
Sixteen *Fusarium* isolates belonging to *F. graminearum* Schw. and *F. culmorum* (W.G. Smith) Sacc. produced vomitoxin and zearalenone on cracked corn at 28 C. Quantitation for vomitoxin was by gas-liquid chromatography. This toxin was produced in quantities of 5 to 236 µg/g of fermented corn. Vomitoxin showed weak antibiotic activity against *Penicillium digitatum* Sacc., *Mucor ramannianus* Moller, and *Saccharomyces bayanus* Sacc., but did not inhibit gram-positive, gram-negative, or acid-fast bacteria. The two molds and the yeast were inhibited by T-2 toxin at µg, and diacetoxyscirpenol inhibited the molds at 5 µg and the yeast at 50 µg. AA
- 3071 ROWLAND (I). The influence of the gut microflora on food toxicity. *Proc. Nutr. Soc.* 40(1); 1981; 67-74
- 3072 BROWN (RR). The role of diet in cancer causation. *Food Technol.* 37(3); 1983; 49-56
Prevalence of cancer among population within the country and in different countries, role of fat in causing cancer; preventive role of vitamin A, dietary recommendations to reduce cancer incidence are the aspects covered. KAR
- 3073 ROSE (DP). Diet, hormones, and cancer. *Food Technol.* 37(3); 1983; 58-62, 67
- 3074 NIELSEN (FH). Effect of trace minerals and vitamins on tumor formation. *Food Technol.* 37(3); 1983; 63-7
- 3075 WOLLARD (JJ). Nutritional management of the cancer patient. *Food Technol.* 37(3); 1983; 69-72
- 3076 ROE (FJC). Are nutritionists worried about the epidemic of tumours in laboratory animals? *Proc. Nutr. Soc.* 40(1); 1981; 57-65

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GENERAL

- 3077 ANON. Excerpts from Food Department Report for 1981-82 on production and procurement. *Indian Miller*. 12(5); 1982; 19-25
Highlights of activities of Department of Food, Government of India, with regard to food management including production of food grains, procurement by the Government storage and warehousing and wheat roller milling industry, during the year 1981-82, are given. MVG
- 3078 O'CATHAIN (D). Innovation in food - the next decade - introduction. *Inst. Food Sci. Technol.* 15(3. Pt.1); 1982; 86-91
The problem is discussed taking into consideration the economic pressures, social pressures and the dietary pressures. KAR
- 3079 ANON. Frozen food developments. *Br. Food J.* 84(911); 1982; 170-71
- 3080 WATANABE (T). Japanese food industry with emphasis on traditional foods. *Indian Food Ind.* 1(3); 1982; 81-9
Discusses: characteristics of food industry; and its present position; rice; wheat; soyabean starch; fruit; vegetables; fish; technical problems to be solved; government administration and quality of foods; and conclusion. BSN
- 3081 NORBACK (JP) and LOPEZ-SORIANO (EM). Cost optimal demand forecasting for a multi-label inventory environment. *J. Food Process. Eng.* 5(3); 1982; 175-83
- 3082 MARSHALL (KR). Treating food wastes for profit. Physico-chemical separations. Ultrafiltration and reverse osmosis. *CSIRO Food Res. Q.* 42(1); 1982; 7-14
The review covers main features of ultrafiltration and reverse osmosis, including their design, commercial uses; pretreatment for membrane processing; removal of biochemical oxygen demand; costs of membrane processes; and use in other food wastes. KAR

FOOD PROCESSING AND PACKAGING

PROCESSING

- 3083 HARNOY (A) and RADAJEWSKI (W). Optimization of grain drying-with rest-periods. *J. Agric. Eng. Res.* 27(4); 1982; 291-307
A method of drying grain with alternate periods of blowing hot air through the grain bed (bin) followed by rest-periods is considered. An attempt is made to give the base relationship between the "blowing ratio", that is, the ratio of the cycle time to the blowing time, and the efficiency of drying for various temperatures and air velocities through the grain. The effect of this drying method on the final quality of the grain is also discussed. The practical application of the above drying system was considered in a multi-bin drier where the number of bins was

equal to the value of the blowing ratio. It was established that this system, operating at its optimum blowing ratio, was more economical than the conventional system with continuous blowing. AA

- 3084 ANON. Food irradiation. *Br. Food J.* 84(911); 1982; 174-5, 183
A brief review of radiation applications in foods, the potential and the current applications and the status of food radiation in some countries. BSN

- 3085 DEITCH (J). Economics of food irradiation. *CRC Crit. Rev. Food Sci. Nutr.* 17(4); 1982; 307-34
Discusses: technological parameters; product characteristics; facility characteristics; source considerations; determination of radionuclide source size for a planned throughput; operating cost of radionuclides; comparison-cobalt and cesium; method of depreciation for radionuclides; electron accelerators; calculation of throughput and machine costs per kilogram of product; cryogenic temperatures (for radiation sterilization); methods of financing and return of investment; investment capital and costs. BSN

- 3086 KNORR (D). Effects of recovery methods on the functionality of protein concentrates from food processing wastes. *J. Food Process. Eng.* 5(4); 1982; 215-30

The objective of this paper was to identify effects of protein coagulation and dehydration of food protein concentrates on the functionality of these products. The results indicate the influence of method of protein coagulation and type of coagulant on protein solubility. Water binding capacity and baking properties. Dehydration conditions, methods of dehydration and pH of the protein coagulate affect the water binding capacity and protein solubility of plant protein concentrate. KAR

PACKAGING

- 3087 MANNHEIM (C) and PASSY (N). Internal corrosion and shelf-life of food cans and methods of evaluation. *CRC Crit. Rev. Food Sci. Nutr.* 17(4); 1982; 371-407

Discusses: structure of tin plate for food cans; corrosion of the plate; corrosion in food cans; methods for evaluating corrosion and shelf life; considerations in choice of type of cans; and recent developments and future trends. BSN

- 3088 URIBE-SAUCEDO (SM) and RYLEY (J). A comparative study of ascorbic acid and thiamine retention in pouch sterilization and canning. *Inst. Food Sci. Technol.* 15(3. Pt.1); 1982; 120-28

In all samples, canning process destroyed a larger amount of vitamin C and B₁ than the alternative pouch process. Pouch processing can greatly improve water soluble nutrient retention by permitting packaging without unnecessary liquids. Retention of nutrients is more in pouch packaging due to the reduction of processing time and the possibility of packaging without liquids which avoids leaching of water soluble nutrients. KAR

- 3089 GILBERT (J) and STARTIN (JR). Determination of acrylonitrile monomer in food packaging materials and in foods. *Food Chem.* 9(4); 1982; 243-52

An automated headspace gas chromatographic method is described using nitrogen specific detection for the quantification of acrylonitrile monomer (AN) in acrylonitrile-butadiene-styrene (ABS) food packaging tubs and in the contained foods. For a limited number of retail foods, levels of AN in ABS tubs (ranging from 2 to 10 mg/kg) and their contents (soft margarine, butter and shortening) are reported (ranging from 0.01 to 0.05 mg/kg), the results being confirmed by mass spectrometry (low and medium resolution selected ion monitoring). The latter technique was also used to quantify the levels of AN in the coatings of retail packaging films on a range of substrates, which were found to be between <0.001 and 0.02 mg/m². AA

- 3090 TUOHY (JJ). Some mechanical properties of linear-low density polyethylene food packaging films. *Ir. J. Food Sci. Technol.* 6(1); 1982; 61-7
The tensile properties, tear strength and impact resistance of linear low density polyethylene (L-LDPE) food grade films were measured and compared with those of conventional LDPE food grade films. The L-LDPE films were found to have a greater tensile strength than conventional LDPE and to stretch more before breaking. At 40-50% reduction in film thickness relative to LDPE, the L-LDPE films had a lower impact resistance than conventional LDPE. Variations in the mechanical properties of similar films from different suppliers were observed. AA
- 3091 PAYNE (PW). Systems and technologies for date marking. The requirements of the food packaging company. *IFST Proc.* 15(3.Pt.2); 1982; 162-74
The requirements of the food packaging company, different systems available for labelling, including labelling, direct marking, like using conventional ink, stamping foil, perforation, ink jet printing, touch dry ink, water set ink, and laser are covered. KAR
- 3092 WARD (AG). The date marking of prepacked foodstuffs. *IFST Proc.* 15(3.Pt.2); 1982; 138-9
- 3093 CHAPMAN (MA). The law relating to the date marking of food. *IFST Proc.* 15(3.Pt.2); 1982; 140-52
Items exempted from date marking, and the reason for such exemption, summary of the food labelling regulations 1980 in so far as they relate to the date marking of food are the aspects covered. KAR

FOOD ENGINEERING AND EQUIPMENT

- 3094 ESSER (K). Genetics: Task, potential and limits in biotechnology. *Chemie Ingenieur Technik* 53(6); 1981; 401-8 (German)
- 3095 SAHM (H). Biology of methane formation. *Chemie Ingenieur Technik* 53(11); 1981; 854-63 (German)
- 3096 BAR (W) and RUPPERT (W). A programmable dosing system for very small amounts of liquids. *Chemie Ingenieur Technik* 53(6); 1981; 446-9 (German)

- 3097 LEUSCHNER (G). Process technological criteria in the selection of liquid pumps. *Chemie Ingenieur Technik*. 53(7); 1981; 507-18
- 3098 CLEARY (SF). Microwave radiation effects on humans. *Bioscience*. 33(4); 1983; 269-73
- 3099 SCHLUNDER (E-U). Scientific fundamentals for the design of contact driers for coarse particle flowable materials. State of the art. *Chemie Ingenieur Technik*. 53(12); 1981; 925-41 (German)
- 3100 REISSINGER (KH), SCHROTER (J) and BACKER (W). Possibilities and problems in extractor design. *Chemie Ingenieur Technik*. 53(8); 1981; 607-14 (German)
- 3101 TRAMBOUZE (P). Methodology of scaling up chemical reactors. *Chemie Ingenieur Technik*. 53(5); 1981; 344-51 (German)
- 3102 BOHM (HJ) and SCHMIDT-TRAUB (H). Layout of condensers for gas-steam mixtures considering plant point of view. *Chemie Ingenieur Technik*. 53(5); 1981; 395
- 3103 REUTER (H). Plant for ultra-high temperature processing of foodstuffs. State of the art and optimization. *Chemie Ingenieur Technik*. 53(6); 1981; 409-18 (German)
- 3104 BURRELL (NJ), SMITH (EA) and ARMITAGE (DM). Air distribution from ventilation ducts under grain. *J. Agric. Eng. Res.* 27(4); 1982; 337-54
 Using experimental measurements and simulations, air pressures in perforated ventilation ducts under bulks of grain were related to air distribution through the grain above the ducts. In shallow grain layers and at high velocities, the static pressure in the duct close to the fans was up to 20 times that at the distant end when the air was sucked into the ducts, so producing a large difference in airflow through the grain bulk at opposite ends of the duct. When air was blown into the ducts the air distribution improved considerably, although a regain of static pressure occurred at the distant end of the duct of up to 4 times that at the fan end. In blowing systems, air distribution was acceptable at moderate air velocities in a duct of constant cross section but was improved by reducing the diameter of the ducting in stages along the store, by increasing the grain depth, by introducing partial barriers into the duct or by using ducts with higher internal friction. AA
- 3105 OETIKER (H). The new MVRS filter series. *Indian Miller* 12(6); 1982; 15-7
 A new filter design, MVRS introduced recently in flour mills has been described with its advantages. The new MVRS series retains the low-pressure single-bag cleanoff system of the earlier systems, but incorporates the cleaning air tank in the filter housing. MVG
- 3106 SHARP (AK) and COUSINS (ER). 'Contestor', an automatic pressure-decay timer. *CSIRO Food Res. Q.* 42(1); 1982; 14-7
 The gas lightness of an enclosure is usually measured with a pressure test for which an inclined manometer is often used. A device has

been developed to simplify the performance of the pressure decay test by replacing the inclined manometer and stopwatch with an automatic timer operated by pressure sensors. 'Contestor' which is built in a weather-proof case as a self-contained battery-operated unit can be used in wet or dusty conditions. An optional pressure gauge indicates the pressure within the test enclosure and can be used to check the settings of the pressure switches. KAR

- 3107 BISHOP (DG), SPRATT (WA) and PATON (D). Computer plotting in 30 dimensions: A program designed for food science applications. *J. Food Sci.* 46(6); 1981; 1983-43
- 3108 LABROPOULOS (AE), LOPEZ (A) and BAKER (JL). A computerized procedure for estimating chemical changes in thermal process systems. *J. Food Sci.* 46(6); 1981; 1976-7

ENERGY IN FOOD PROCESSING

- 3109 ARNOLD (D) and BARTMANN (L). Energy saving in process engineering. *Chemie Ingenieur Technik.* 53(7); 1981; 497-507 (German)''
- 3110 KLEIN-SCHIPHORST (HAJ). Proposals for energy saving in mills. *Getreide Mehl Brot.* 35(5); 1981; 120-4 (German)
- 3111 CHHINNAN (MS) and SINGH (RP). Energy conservation in a continuous atmospheric retort. *Food Sci. + Technol.* 14(3); 1981; 122-66

FOOD CHEMISTRY AND ANALYSIS

- 3112 LATTANZIO (V) and MARCHESINI (A). Determination of plant phenols by gel filtration. *J. Food Sci.* 46(6); 1981; 1907-9, 1917
- The new method for chromatographic separation and UV spectrophotometric determination of O-diphenol active principles of plants is based on a technique of gel filtration on Sephadex LH 20. This technique offers selectivity, resolution, and sensibility: minimum detectable 5 µg/ml. Interactions between the gel and substances examined, which control chromatographic separation, were studied. The method is useful for objectively assessing the quality of plant products and suitable for automation in the case of routine analysis. AA
- 3113 GREGER (JL) and BAIER (M). Tin and iron content of canned and bottled foods. *J. Food Sci.* 46(6); 1981; 1751-4, 1765
- The tin and iron content of 14 different types of canned foods and of 5 different types of bottled foods were determined. No tin was detected in most bottled foods, but tin was detected in all canned foods. Storage of foods on the shelf for 4 months or in open cans in the refrigerator for 1 week resulted in increased amounts of tin and iron in some of the canned foods. Those foods which were packed in totally lacquered cans accumulated little tin or iron during storage; those foods which were packed in unlacquered or partially lacquered cans generally accumulated significant amounts of iron and tin during storage.

The tin content of the canned foods was not statistically correlated to the pH of the foods. AA

- 3114 FINLEY (JW), WHEELER (EL), WALKER (HG) Jr. and FINLAYSON. Effect of cystine oxidation on lysinoalanine formation in proteins. *J. Agric. Food Chem.* 30(5); 1982; 818-20
- 3115 WATANABE (M), SHIMADA (A), YAZAWA (E), KATO (T) and ARAI (S). Proteinaceous surfactants produced from gelatin by enzymatic modification: Application to preparation of food items. *J. Food Sci.* 46(6); 1981; 1738-40
- Proteinaceous surfactants produced from gelatin by papain-catalyzed incorporation of L-leucine *n*-alkyl esters were used as ingredients replacing conventional surfactants for food use. The incorporation of leucine C₂-C₆ alkyl esters gave surfactants effective in making snow jelly. In ice cream making, a leucine C₁₂ alkyl ester-incorporated product used as the surfactant gave a high degree of overrun even in a few minutes from the start of whipping. This surfactant was applicable also to making mayonnaise, with formation of a fine emulsion having favourable hardness and adhesiveness. In bread making as well, the same surfactant was usable and found preferable to monostearin. The use of this surfactant resulted in satisfactory loaf quality as well as slow staling of bread over a long period of storage. AA
- 3116 MOREYRA (R) and PELEG (M). Effect of equilibrium water activity on the bulk properties of selected food powders. *J. Food Sci.* 46(6); 1981; 1918-22
- 3117 ALZAMORA (SM), CHIRIFE (J) and FONTAN (CF). Effect of surface active agents on water activity of IM food solutions. *J. Food Sci.* 46(6); 1981; 1974-5
- 3118 MCCUNE (TD), LANG (KW) and STEINBERG (MP). Water activity determination with the proximity equilibration cell. *J. Food Sci.* 46(6); 1981; 1978-9
- 3119 COOKE (JR). Some recent advances in food analysis. *Food Technol. Aust.* 34(12); 1982; 570-72
- Near infra-red reflectance and pulsed nuclear magnetic resonance for determining some major constituents and the methods for determining minerals, vitamins and trace constituents have been described. Reference is also made to good laboratory practice. KAR
- 3120 FRIEND (DR) and CHANG (GW). Simple dye release assay for determining endopectinase activity. *J. Agric. Food Chem.* 30(5); 1982; 982-5
- 3121 TAM (GKH) and LACROIX (G). Dry ashing hydride generation atomic absorption spectrometric determination of arsenic and selenium in foods. *J. Assoc. Off. Anal. Chem.* 65(3); 1982; 647-50
- Samples were dry-ashed with Mg(NO₃)₂-MgO and dissolved in HCl. Selenate was reduced to selenite by boiling in 4N HCl, and arsenate to arsenite by treatment with KI. Hydrides of arsenic and selenium were generated by the addition of NaBH₄ and were swept by nitrogen and hydrogen into a thermally heated silicate tube furnace. The detection limit

was about 5 ppb for each element based on a 10 g sample. Analytical results obtained for several samples of NBS reference materials agreed with the certified values. The procedure was evaluated by another laboratory and results were satisfactory. AA

- 3122 BORGGAARD (OK) and WILLEMS (M). Caution in nitric acid digestion of organic samples in closed systems. *J. Assoc. Off. Anal. Chem.* 65(3); 1982; 762-3

There is a risk of explosion when organic samples are digested with nitric acid in a closed vessel at elevated temperatures for elemental analysis. Sample size and the size, material, and thickness of bomb walls should be carefully considered. Digestion in an open flask may be a safer alternative. AA

- 3123 LYNCH (MJ) and BARTOLUCCI (SR). Identification and confirmation of pyrantel- and morantel- related residues in liver by gas chromatography-mass spectrometry with selected ion monitoring. *J. Assoc. Off. Anal. Chem.* 65(3); 1982; 640-46

- 3124 ENTZ (RC), THOMAS (KW) and DIACHENKO (GW). Residues of volatile halocarbons in foods using headspace gas chromatography. *J. Agric. Food Chem.* 30(5); 1982; 846-9

As part of a pilot project to measure the exposure of population groups to contaminants in air, food, and water, volatile halocarbon (VHC) residues were determined in foods by using gas chromatographic headspace analysis. Thirty-nine different food items were purchased at retail markets in each of three geographical areas in accordance with the Food and Drug Administration's Total Diet Market Basket program. The foods were prepared as for consumption and divided into four composites representing dairy products; meat, fish, and poultry; oils, fats, and shortening; and beverages. Twenty composites (five sets of the four listed) were analyzed; eight contained VHC residues (chloroform, bromodichloromethane, 1,1,1-trichloroethane, and trichloroethylene), generally at ppb (nanograms per gram) concentrations. The individual foods in the eight positive composites were also analyzed to determine which foods contained VHCs. Evaluation of the approach indicates that it is suitable for screening a wide variety of foods for VHC residues. AA

- 3125 KAN (GYP), MAH (FTS) and WADE (NL). Adsorption of 2,4-dichlorophenoxyacetic acid on glassware as source of error in 2,4-d analysis. *J. Assoc. Off. Anal. Chem.* 65(3); 1982; 763-5

2,4-dichlorophenoxyacetic acid (2,4-D) may be quantitatively recovered by direct methylation with diazomethane in Pyrex evaporating flasks; it may also be desorbed with methylene chloride in the presence of strong H_2SO_4 . This step must be taken when 2,4-D is transferred from one glass vessel to another to ensure accuracy of data. AA

- 3126 FOX (JB), DOERR (RC) and LAKRITZ (L). Interaction between sample preparation techniques and three methods of nitrite determination. *J. Assoc. Off. Anal. Chem.* 65(3); 1982; 690-95

The methods used were the AOAC method of dilution and heating; the addition of mercuric chloride, charcoal, and Carrez reagents at 2 different pH values; and direct analysis of sample supernatants with no treatment (control). The effect of these initial conditions and prepa-

ration methods on measured nitrite was determined by using 3 different Griess reagent combinations and chemiluminescent and differential pulse polarographic techniques. Systematic variations were observed in samples treated with mercuric chloride, while the addition of Carrez reagents had little or no effect. Best results were obtained by the AOAC dilution/heating method under alkaline conditions, or by charcoal addition followed by chemiluminescent or colorimetric nitrite determination. Statistical analysis of the nitrite concentrations determined in the several samples showed that these 3 procedures were precise to about 5-6% CV, which was not significantly different from the CV value of 4% determined from replicate analyses. AA

- 3127 SRIKAR (LN) and CHANDRU (R). Determination of organic nitrogen by Kjeldahl digestion using hydrogen peroxide. *J. Food Technol.* 18(1); 1983; 129-33

- 3128 NAKAZOE (J-I). Application of high performance liquid chromatography to the analysis of carotenoid pigments. *Bull. Jpn. Soc. Sci. Fish.* 48(7); 1982; 1007

This paper deals with the application of HPLC with normal and reversed phase columns to the analysis of carotene, hydroxy and carbonyl carotenoids, and with the possibility of quantitative microanalysis. Identification and quantitative analysis of carotenoids on the scale of ng are possible in a short time. KAR

- 3129 DI NOLA (A) and BROSIO (E). Bound and free water determination by pulsed nuclear magnetic resonance. A method for data analysis in the presence of exchange. *J. Food Technol.* 18(1); 1983; 125-8

In the present paper, the analysis of the transverse magnetization decay curves of water is discussed. Whenever the spin-echo decay curve of water does not show a single exponential behaviour and the apparent relaxation rates of bound and free component vary with the moisture content, an exchange process must be hypothesized. A method for obtaining the amount of bound and free water, in the presence of exchange, is reported. If the described procedure is applied, the amount of bound water as determined by pulsed nuclear magnetic resonance (NMR) is in good agreement with the amount of unfreezable water as determined by other techniques. AA

FOOD LAWS AND REGULATIONS

- 3130 MOLLENHAUER (HP). Technical aids in the Codex and from the German and Italian viewpoints. *Gordian.* 81(5); 1981; 122-4 (German)
- 3131 ANON. Community consumer protection law. *Br. Food J.* 84(910); 1982; 133-4, 143

FOOD MICROBIOLOGY

- 3132 ZEDDELMANN (H. von). The world of microbes. Review for the practical man in the food industry. *Getreide Mehl. Brot.* 35(4); 1981; 96-100 (German)

The food technologist must make himself more familiar than before, with the growth conditions, avenues of infection, and hygienic measures. Prematurely moulded baked goods are often not one's inescapable destiny, but rather the result of defective methods of working and thinking. KMD

- 3133 JARVIS (B). Rapid methods in food microbiology. A practical approach. *Food Technol. Aust.* 34(11); 1982; 518-23

Methods considered in this include those that require rapid tests taking less than an hour; rapid tests requiring some 6-12 hours; and labour saving or material-saving methodologies. KAR

- 3134 FUNG (DYC) and COX (NA). Rapid microbial identification systems in the food industry. Present and future. *J. Food Prot.* 44(11); 1981; 877-80, 885

- 3135 CHRISTIAN (JHB). Developments in microbiological criteria for foods. *Food Technol. Aust.* 34(11); 1982; 498-9

- 3136 ANON. Enzyme preparations in food production. *Br. Food J.* 84(911); 1982; 167-9

Report of the FACC review on the control of enzyme preparations in food and recommendations for regulations. BSN

- 3137 PETER (J), PRENOSIL (JE) and BOURNE (JR). Comparison of various methods to determine kinetic constants for β -galactosidase in soluble and immobilised states. *J. Chem. Technol. Biotechnol.* 31(11); 1981; 705-9

- 3138 PELLON (JR), SANZ (B) and GOMEZ (RF). Thermal injury and cellular viability in bacteria. *Rev. Agroquím. Tecnol. Aliment.* 21(2); 1981; 211-24 (Spanish)

The authors have discussed the type of damage that can occur in the cells of bacteria subjected to a moderate heat treatment (50-60 C). The structural and functional changes that occur during thermal injury and subsequent repair of cell tissue have been mentioned. The importance of these alterations and their influence on viability changes have been discussed. KMD

- 3139 PANTSCHIEV (Ch), KLENZ (G) and HAFNER (B). Comparative characterization of alpha-amylase preparations. *Lebensmittelindustrie.* 28(2); 1981; 71-84 (German)

The simultaneous influence of pH value, temperature, substrate and calcium ions on some α -amylase preparations BAN 240, amylase 80X, Dexlo 50, α -amylase ZF-178 from species of *B. subtilis* and the fungamyl 800L from *A. oryzae* has been studied. No significant differences were found with regard to the effect of α -amylases on the substrate. Addition of calcium ions to the substrate solution increased the temperature stability of α -amylase, and improved the pH value stability was obtained. No differences were found in the pH value and temperature of the four α -amylases from *B. subtilis*. Paper chromatographic separation of Lintner starch showed that, after an incubation period of 3 hours, more maltose and less long chain Dextrine (bigger G₆) are formed with fungamyl. VR

- 3140 ZAMOLA (B), VALLES (P), SARIC (A), KUBOVIC (M), SIDOR (C) and MICCOLI (P). *Bacillus thuringiensis*. An insecticidal microorganism with perspective. *Process Biochem.* 18(1); 1983; 5,8-9

- 3141 AVENDANO (MC) and CORNEJO (I). Isolation and classification of methanol-utilizing *Pseudomonas*. *Rev. Agroquim. Tecnol. Aliment.* 21(2); 1981; 267-75 (Spanish)

The aim of this work was screening of *Pseudomonas* capable of assimilating methanol as a sole source of carbon and energy in order to obtain biomass. The isolations were carried out from several soil samples from different regions, by enrichment culture in a mineral salts medium containing methanol. It was found that among the 103 strains, that were isolated, and most of them identified as species of the genus *Pseudomonas*, 16 showed so good growth on methanol, that they could be considered as potential biomass makers. AA

YEAST

- 3142 SCHACHTEL (AP). Assessment of the changes in *Candida utilis* proteins produced by preparative processes. *J. Food Sci.* 46(6); 1981; 1822-6

FUNGI

- 3143 DONGOWSKI (G) and BOCK (W). Characterization of the splitting mechanism of pectin esterase from *Aspergillus niger*. *Nahrung.* 25(3); 1981; K5-K7 (German)

An activity test, using endo-polygalacturonases (PG; EC 3.2.1.15), has been proposed for the characterization of the non-uniform splitting mechanism of pectinesterases (PE) of different origins. It was found that the splitting mechanism established previously for the PE from *Aspergillus japonicus* 4 is also valid for the PE from *Aspergillus niger*. KMD

- 3144 TAKAMATSU (T), SHIOYA (S) and FURUYA (T). Mathematical model of gluconic acid fermentation by *Aspergillus niger*. *J. Chem. Technol. Biotechnol.* 31(11); 1981; 697-704

MUSHROOM

- 3145 NAPOLITANO (JJ). Isolation of amoebae from edible mushrooms. *Appl. Environ. Microbiol.* 44(1); 1982; 255-7

Isolation of amoebae from the surface and internal tissues of edible mushrooms was investigated. Samples tested over a 3-year period included mushrooms cultivated from six geographic localities. Of 168 mushroom surfaces tested, 161 (96%) yielded amoebae. Of 166 samples of internal stalk and cap tissues tested, only 1 yielded amoebae. AA

VINEGAR

- 3146 LEVONEN (E) and SUAREZ (MA). Nutrients requirements for the obtention of white vinegar. *Rev. Agroquim Tecnol. Aliment.* 21(2); 1981; 259-66 (Spanish)

Studies to establish the nutrient requirements for vinegar production in submerged fermentation, using ethanol as substrate, were carried out. In a laboratory fermenter, the nutrient requirements are: ethanol

10%; $(\text{NH}_4)_2\text{HPO}_4$, 0'6 g/l; K_2HPO_4 , 0'4 g/l; $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$, 10 g; $\text{MnSO}_4 \cdot 4\text{H}_2\text{O}$, 0'5 g; FeCl_3 , 0'1 g; Ca-panthotenate, 0'3 g; K-citrate, 10 g; glucose, 100 g. The addition of yeast was necessary. AA

FOOD ADDITIVES

- 3147 KUHNERT (P). The E-numbers of additives. *Gordian*. 81(11); 1981; 270-272 (German)

Food additives are classified in West Germany and the European Community on the basis of their function, or field of application. The latter is indicated by a code number, the so-called E-number. The E-numbers of nearly 150 additives have been listed, under the following headings: (i) colours, (ii) preservatives, (iii) antioxidants, (iv) acids and salts, (v) thickening and gelling agents, and stabilizers, and (v) emulsifiers. KMD

- 3148 BEUCHAT (LR). Effects of potassium sorbate and sodium benzoate on inactivating yeasts heated in broths containing sodium chloride and sucrose. *J. Food Prot.* 44(10); 1981; 765-9

- 3149 RUBACH (K) and BREYER (Chr). Isotachophoretic determination of mould inhibitors (preservatives) in baked products and additives used in them. *Getreide Mehl Brot*. 35(4); 1981; 91-3 (German)

The analytical method described in this paper is cheaper and less time consuming than other methods known. It requires about 15 minutes to analyse a sample of food rich in fat, and about 7-10 minutes for a sample of low fat content. The recovery rate is 97-101%, i.e. very good; the variation coefficient between different analyses is only 2%. KMD

- 3150 HUHTANEN (CN), TALLEY (FB), FEINBERG (J) and PHILLIPS (JG). Flavour and antibotulinal evaluation of sorbic acid - containing bacon. *J. Food Sci.* 46(6); 1981; 1796-800

- 3151 SAXBY (MJ), STEPHENS (MA) and REID (RG). Degradation of sorbic acid in model food systems. *Food Chem.* 9(4); 1982; 283-7

Solutions of sorbic acid are unstable in the presence of sulphur dioxide and light. At pH 2.1 in the presence of excess sulphur dioxide, sorbic acid was totally degraded in 8 days. Sorbic acid was also unstable in solutions of dilute sulphuric acid. Two volatile products from the degradation in sulphur dioxide solution and in dilute sulphuric acid were identified as α -angelica acetone and 2-methyl-5-acetylfuran. AA

- 3152 YOUSEF (AE) and MARTH (EH). Growth and synthesis of aflatoxin by *Aspergillus parasiticus* in the presence of sorbic acid. *J. Food Prot.* 44(10); 1981; 736-41

Two media (basal (M_1) and enriched (M_2) containing potassium sorbate (0-300 ppm as sorbic acid) were inoculated with spores (10^4 - 10^6 /flask) of *Aspergillus parasiticus* and incubated for 5 days at 28 C. The greater the amount of sorbate added, the higher was the pH of the media after incubation and the smaller was the yield of mold mycelium. Intermediate amounts of sorbate sometimes resulted in greater accumulation of aflatoxin than when media were free of sorbate. Sorbate more effectively

inhibited mold growth and aflatoxin production in medium M_2 than M_1 and when the small rather than the large inoculum was used. A second trial was done with 10^6 or 10^5 spores/flask of M_2 (ca. 27 ml) and 10^5 spores/flask of M_2 (ca. 27 ml) containing sorbate (200 ppm of sorbic acid). Cumulative data for mold growth, pH and content of aflatoxin in the medium showed that relative effects of different treatments changed during the incubation period. An index to measure the capacity of molds to synthesize aflatoxins was developed. Application of the index indicates that sorbate delayed mold growth but did not inhibit biosynthesis of aflatoxin. The ability to synthesize aflatoxin was greatest in the early stages of mold growth and then decreased linearly as mold growth progressed. AA

- 3153 SOMERS (EB) and TAYLOR (SL). Further studies on the antibotulinal effectiveness of nisin in acidic media. *J. Food Sci.* 46(6); 1981; 1972-3

- 3154 DANIELS (DH), WARNER (CR) and FAZIO (T). Gas chromatographic determination of sorbitol, mannitol and xylitol in chewing gum and sorbitol and mints. *J. Assoc. Off. Anal. Chem.* 65(3); 1982; 588-91

Chewing gum is partitioned between methylene chloride and water; the mint is simply dissolved in water. The aqueous extract is dried and the residue is derivatized with pyridine-acetic anhydride to form the corresponding peracetates. The derivatives are quantitated by gas chromatography using a 9 ft x 2 mm column packed with 10% Silar 10C on Chromosorb W/AW. Average recoveries of these sugar alcohols ranged from 96 to 102%. AA

- 3155 HOPPE (K). Taste interactions between citric acid and sucrose and other sweeteners. *Nahrung.* 25(3); 1981; K1-K4 (German)

It has been assumed by Herrmann that equal quantities of citric acid would always neutralize the taste of equal quantities of sugar or (glucose) or sweetener. Hence, tests were conducted with mixtures of sucrose and citric acid, and of sucrose, cyclamate, and citric acid. The effectiveness of citric acid became exponentially smaller as the amount of sweetness to be neutralized increased. The difference observed between sucrose and the artificial sweetener mixture is based on their different peripheral adaptations, and deserves to be examined separately. KMD

- 3156 SPORNS (P). Rapid high performance liquid chromatographic determination of monosodium glutamate in food. *J. Assoc. Off. Anal. Chem.* 65(3); 1982; 567-71

Average recovery of added glutamic acid by a rapid HPLC method was 99.2%. The method could be used to analyze samples such as soy sauce, which contain a large amount of other potentially interfering soluble compounds. AA

- 3157 MASLOWSKA (J) and MARSZAL (K). Separation of food colourants through high pressure liquid chromatography. *Dtsch. Lebensmittel-Rundschau.* 77(8); 1981; 275-8 (German)

The separation of a mixture of the six most important food dyes through high pressure liquid chromatography has been effected on reverse-phase systems. Carrier materials used are Lichrosorb-RP-2, Lichrosorb-RP-18 and Bondapak C₁₈. A water, methanol and water isopropanol with addition of PIC-A reagent (waters) mixture serves as the mobile phase. AA

- 3158 CORRADI (C) and MICHELI (G). Determination of curcumin in the colours sold under the number E 100. *Ind. Aliment.* 20(No. 181); 1981; 201-5 (Italian)

The commercial colour sold in Italy as No. E 100 contains about 65-70% of curcumin, the balance being made up by other curcuminoids. Italian law, however, requires that the colour should be made up of curcumin only. The authors argue that the provisions of the decree of 22nd December, 1967 take into account the biological and toxicological significance of the naturally present impurities, and that it would be unnecessarily costly to obtain a pure curcumin product. KMD

- 3159 ANON. New emulsifiers allow cheaper food production. *Food Technol.* NZ. 17(8); 1982; 29

Provides information about two new emulsifiers - one of them being used to replace margarine in bread baking and another in facilitating the production of less expensive vitamin - rich orange drinks. KAR

- 3160 PECHANEK (U), BLAICHER (G), PFANNHAUSER (W) and WOIDICH (H). Electrophoretic method for qualitative and quantitative analysis of gelling and thickening agents. *J. Assoc. Off. Anal. Chem.* 65(3); 1982; 745-52

Thickeners were identified by an electrophoretic method for their migration behaviour, their staining ability, and the characteristic shapes of their electrophoretic zones, and then quantitated in a scanner. A method is also reported for isolating thickeners from food, including removal of fat and dyes by dioxane, enzymatic starch degradation, removal of protein by trichloroacetic acid, and precipitation of the polysaccharides by absolute ethanol. Isolation of gelatin is also described. AA

- 3161 PUTTEMANS (ML), DRYON (L) and MASSART (DL). Evaluation of thin layer, paper and high performance liquid chromatography for identification of dyes extracted as ion-pairs with tri-*n*-octylamine. *J. Assoc. Off. Anal. Chem.* 65(3); 1982; 730-36

Food dyes, extracted into chloroform as ion-pairs with tri-*n*-octylamine, are chromatographed directly in various liquid chromatographic systems. Dyes can be identified by comparison of the chromatographic behaviour of ion-pairs with behaviour of reference dyes dissolved in water. In thin layer and paper chromatography, the ion pairs dissociate when polar eluants are used; thin layer chromatography is preferred because of less tailing. In high performance liquid chromatography, a reverse phase ion-pair system is used with tetrabutylammonium as the counter ion; chloroform-extracted dyes show retention times similar to reference dyes dissolved in water. AA

- 3162 PUTTEMANS (ML), DRYON (L) and MASSART (DL). Isolation, identification and determination of food dyes following ion-pair extraction. *J. Assoc. Off. Anal. Chem.* 65(3); 1982; 737-44

Food dyes are extracted as ion-pairs with tri-*n*-octylamine and tetrabutylammonium. Extraction from aqueous solutions to chloroform is quantitative with 0.1M counter ion concentrations. The dye may be back-extracted to an aqueous phase with chloride, bromide, iodide, nitrate, or perchlorate ions; perchlorate is most successful. The method is applied to the qualitative analysis of dyes in grenadine, pickles, and milk desserts, and quantitative analysis in alcoholic beverages. Commercial samples are analyzed by using a standard addition method. AA

CEREALS

- 3163 LAI (FS) and MILLER (BS). An inexpensive method for treating grain dust to prevent fine particles from becoming airborne during handling. *Cereal Chem.* 59(5); 1982; 444-5
- 3164 MONGEAU (R) and BRASSARD (R). Insoluble dietary fiber from breakfast cereals and brans: Bile salt binding and water-holding capacity in relation to particle size. *Cereal Chem.* 59(5); 1982; 413-7
- 3165 OSBORNE (BG), DOUGLAS (S) and FEARN (T). The application of near infrared reflectance analysis to rapid flour testing. *J. Food Technol.* 17(3); 1982; 355-63
- Calibrations are presented for the analysis of flour for protein, moisture, particle size, colour and starch damage by means of near infrared (NIR) reflectance analysis. A commonly used NIR instrument was subjected to a thorough evaluation for its accuracy in flour testing for these parameters, by comparison of NIR with existing methods of analysis over an extensive period of time. The accuracy and precision of NIR for the parameters studied were satisfactory for quality control purposes and therefore the technique has an important place in the rapid flour testing. AA
- 3166 KILBORN (RH) and PRESTON (KR). A modified extensigraph procedure for measuring the stretching properties of fermented dough. *Cereal Chem.* 59(5); 1982; 381-4
- A modified extensigraph procedure is described for measuring the viscoelastic properties of fermented doughs. The procedure involves processing doughs in a manner similar to a given baking method. Doughs are proofed on a modified extensigraph holder and stretched. Large differences were obtained in the extensigraph properties of doughs varying in inherent flour strength. Proof times and oxidation (bromate) level also had significant effects. Increasing proof time of fermented doughs before stretching resulted in a relaxation process similar to that usually obtained with unfermented doughs. Increasing bromate levels increased extensigraph height and decreased extensibility. AA
- 3167 SORRELLS (KM). Rapid detection of bacterial content in cereal grain products by automated impedance measurements. *J. Food Prot.* 44(11); 1981; 832-4, 838
- 3168 MULLER (HG). Investigations on "Baked Cereal Rusk". Influence of baking conditions on the quality of baked cereal rusk. *Getreide Mehl Brot.* 35(5); 1981; 127-9 (German)
- The recipe and method of production for Baked Cereal Rusk (BCR) have been described, including the method of drying and comminution after baking. The texture test, the Buchner test, and the determination of sedimentation volume are recommended as tests of quality. KMD
- 3169 MARAMBA (FK). The flour milling industry in the Philippines. *Indian Miller.* 12(6); 1982; 5-9
- After briefly mentioning the historical aspects of the Philippines flour milling industry, the author discusses the National Wheat Programme of the Government, and the pattern of consumption of wheat flour in the

country. The performance of the major (8 nos.) flour mills in the country during the past 5 years is described and the various problems faced by the industry are indicated. Recommendations to solve the current problems are also given. MVG

- 3170 BRUMMER (J-M). Investigations with "short extensogram" in milling laboratories. *Getreide Mehl Brot*. 35(5); 1981; 115-7 (German)

RICE

- 3171 BARBER (S), BENEDITO DE BARBER (C) and MARTINEZ (J). Proteins of rice bran. II. Potential value of fractions of rice bran as ingredients in protein foods. *Rev. Agroquim. Tecnol. Aliment.* 21(2); 1981; 247-58
Rice bran was first stabilized by moist heat, then separated into two low-fibre and two high-fibre fractions, after a selective grinding and sieving in water, followed by a centrifugation and a spray-drying. These four fractions, together with the parent, raw, full-fat bran (fraction V) and a protein concentrate (33% protein) were investigated as to their potential value as protein food ingredients. All the bran fractions had a low emulsifying capacity, and a very low foaming capacity. Addition of 5-20% of the bran fractions, or of the protein concentrate, to wheat flour increased dough strength, water absorption, and dough stability, while the dough extensibility was decreased. Protein digestibility ranged from 77.6 - 89.6%; aminoacid composition did not show any important differences; available lysine ranged from 3.5 to 3.7 g/100 g protein; anti-trypsin and haemagglutinin activities were extremely low. All samples had an acceptable keeping quality except for the raw full-fat bran (fraction V). KMD
- 3172 ROXAS (BV), INTENGAN (CL) and JULIANO (B). Effect of zinc supplementation and high-protein rice on the growth of preschool children on a rice-based diet. *Qualitas Plantarum*. 30(3/4); 1981; 213-22
A six-month feeding trial was undertaken in a children's home in Manila on three groups of 27 preschool Filipino children, each on a diet in which rice contributed about 50% of the energy. Total zinc intake of 4-6 mg daily was obtained from analyses of food composites of the institutional diet. Supplementation of this diet with 5 mg zinc and substitution of high-protein (10.4%) rice for average-protein rice (~7.4%) together resulted in significantly faster height and weight increases in the experimental group than in the control group. Zinc supplementation alone, however, did not improve the growth of the children. AA
- 3173 HEBEISH (A), ABD EL-THALOUTH (I) and EL KASHOUTI (M). Gelatinization of rice starch in aqueous urea solutions. *Starch*. 33(3); 1981; 84-90
Addition of urea to starch slurry causes gelatinization of starch at room temperature. The time required for gelatinization, type of gel formed, rheological properties and apparent viscosity of starch suspension in urea solutions were determined. The latter did not decrease significantly after storing for up to 8 weeks, whereas gels from cooked starch decreased sharply after one week of storage. Suspensions of starch in urea solutions did not show any fermentation and retrogradation during 8 weeks storage. It is suggested that urea interacts with starch to form adducts or urea starch complexes. The magnitude of the

latter and their abundance are dependent on the concentrations of urea and starch. The urea starch complex acquires very high affinity to water thereby causing swelling and gelatinization of starch. AA

- 3174 LORENZ (K). The starch of wild rice (*Zizania aquatica*) *Starch*. 33(3); 1981; 73-6

- 3175 BECKER (R) and LORENZ (K). Saccharides in wild rice (*Zizania aquatica*). *Food Sci. + Technol.* 14(3); 1981; 134-6

- 3176 VOHRA (P), SHARIFF (G) and JULIANO (BO). Relative nutritional value of some rices for growth of *Tribolium castaneum* larvae. *Qualitas plantarum*. 30(3/4); 1980; 187-93

Growth of red flour beetle *Tribolium castaneum* (Herbst) larvae with brown or milled rice as the carbohydrate source was faster on diets containing milled rice than on those with brown rice. Larval growth was negatively correlated with amylose content of both brown and milled rice. Among high-amylose (>25%) milled rices, heavier larvae were obtained with rices of low gelatinization temperature (alkali-spreading values 6-7) than with those with higher gelatinization temperature (alkali-spreading values <6). The differences in larval growth reflected relative digestibility of raw rice starch granules. AA

- 3177 RIEDEL (HR). Processing of puffed rice. *Gordian*. 81(11); 1981; 262 and 264 (German)

The author has described various types of confectionery articles that can be made with puffed rice, and also a method - in detail - of making puffed rice bars. Stress is laid on the large volume and low calorie content of such puffed rice confections. KMD

WHEAT

- 3178 NGUYEN (LB), GREGORY (JF) III, BURGIN (CW) and CERDA (JJ). *In vitro* binding of vitamin B-6 by selected polysaccharides, lignin and wheat bran. *J. Food Sci.* 46(6); 1981; 1860-62

- 3179 MILLER (BS), HUGHES (JW), AFEWORK (S) and POMERANZ (Y). A method to determine hardness and work of grinding wheat. *J. Food Sci.* 46(6); 1981; 1851-4

The Brabender Farinograph with a burr mill accessory was modified to measure the work in joules to grind 25-55 g of wheat and to provide a digital readout of the data. Temperature (18-20 C), protein content (10.5-15.9%), kernel size, and growth location had little effect on the results, but the work required to grind wheat increased with increasing moisture content (7-13%). The average work was 530 joules (standard deviation 3.3) for 60 samples of a soft white winter wheat and 880 joules (standard deviation 5.3) for 60 samples of a very hard red winter wheat. The method may be suitable for distinguishing between hard and soft wheats. AA

- 3180 MILLER (BS), AFEWORK (S), HUGHES (JW) and POMERANZ (Y). Wheat hardness: Time required to grind wheat with the Brabender automatic micro-hardness tester. *J. Food Sci.* 46(6); 1981; 1863-5, 1869

- 3181 BELITZ (H-D), WIESER (H) and SEILMEIER (W). Comparative studies with gluten-protein fractions from different cereals. *Getreide Mehl Brot*. 35(5); 1981; 118-20 (German)

After examining the peptide fractions isolated so far, authors conclude that, in the prolamines and glutelins of wheat, the distribution of aminoacid residues over the peptide chains is not uniform. There are some sections with a uniform, and some with a non-uniform aminoacid composition. In the prolamines and glutelins of maize, however, the peptide chains are more uniform. Wheat proteins are more suitable for the formation of protein gels, because the formation of such gels requires a three-dimensional lattice with some uniformly structured and some non-uniformly structured elements. Further information will be obtained by determining the aminoacid sequences of selected protein fragments. KMD

- 3182 EWART (JAD). Baking quality and gluten amide level. *J. Food Technol.* 17(3); 1982; 365-72

- 3183 BARBER (KJ) and WARTHESEN (JJ). Some functional properties of acylated wheat gluten. *J. Agric. Food Chem.* 30(5); 1982; 930-34

- 3184 HORVATIC (M), GRUNER (M) and VAJIC (B). Alterations in the biological value of wheat protein when processed into flour and gluten. *Nahrung*. 25(3); 1981; 249-53 (German)

The authors have determined the aminoacid composition of the proteins of whole wheat grain, flour, and gluten, and calculated their biological value. The decrease in individual aminoacids was 8-13% in flour (compared to whole grain) and 2-5% in gluten (compared to flour). The decrease in Mitchell's biological value was 5% in flour (compared to grain) and 8% in gluten (compared to flour). The decrease in Oser's biological value was 9% in flour (compared to grain) and 26% in gluten (compared to flour). KMD

- 3185 LI-CHAN (E) and NAKAI (S). Nutritional evaluation of covalently lysine enriched wheat gluten by *Tetrahymena* bioassay. *J. Food Sci.* 46(6); 1981; 1840-42, 1850

- 3186 BECHTEL (DB), GAINES (RL) and POMERANZ (Y). Protein secretion in wheat endosperm - formation of the matrix protein. *Cereal Chem.* 59(5); 1982; 336-43

- 3187 EGGUM (BO), KREFT (I) and JAVORNIK (B). Chemical composition and protein quality of buckwheat (*Fagopyrum esculentum* Moench). *Qualitas Plantarum*. 30(3/4); 1981; 175-9

The protein content in buckwheat was approximately 12% and thus very much the same as in wheat. The fat content in buckwheat was close to 3%, whereas the crude fiber concentration was very high (12.7 and 17.8% for two varieties). The protein quality was very high, with biological values above 90%. This can be explained by a high concentration of most essential amino acids, especially lysine, threonine, tryptophan, and the sulphur containing amino acids. However, due to the high contents of crude fiber and tannin, the true protein digestibility was slightly below 80%. VR

- 3188 GHALY (TF) and VAN DER TOUW (JW). Heat damage studies in relation to high temperature disinfestation of wheat. *J. Agric. Eng. Res.* 27(4); 1982; 329-36

Three wheat varieties (Teal, Condor and Eagle) of different hardness, conditioned to 12% and 14% moisture content (wet basis), were heat treated in a small batch fluidized-bed rig to determine the conditions for the onset of heat damage. Air inlet temperatures of 70, 75, 80, 85 and 90 C and heating times of 5, 10 and 15 minutes were used. Germination and vigour criteria were used for the detection of heat damage. Results showed that at 12% moisture content, the moisture limit for receipt of wheat in Australia, heating with air of 75 C had no significant effect on ultimate germination or the first count, and that 70 C had no significant effect on seedling mass for all 3 varieties. These temperatures exceed those required for high temperature disinfestation. The effects of temperature and initial moisture content were highly significant but time had little effect. Results also showed that there were differences between the varieties; the soft variety Teal was more susceptible to heat damage and dried faster than the hard varieties. Thus at 14% moisture content, 70 C had a significant effect on all the germination criteria of Teal and the plumule length of Condor and Eagle. There was no significant difference in germination between conditioned and unconditioned controls. The length of plumule was found to be the most sensitive of the 4 measurements taken to detect heat damage, namely the first count, the final count seedling mass and length of plumule. AA

- 3189 MADRID (FJ) and SINHA (RN). Feeding damage of three stored-product moths (Lepidoptera: Pyralidae) on wheat. *J. Econ. Entomol.* 75(6); 1982; 1017-20

Destruction of kernels of wheat caused by feeding of three species of stored-product moths was studied at 27 to 30 $\pm$ 1 C and 80 $\pm$ 2% relative humidity. Larvae of *Ephestia cautella* (Walker) and *Plodia interpunctella* (Hubner) consumed similar quantities of individual wheat kernels during development. *Pyralis farinalis* L. consumed significantly more food ($P < 0.05$) than the other two moths. The part of the kernel eaten, however, varied among the species; *P. interpunctella* consumed 100% of the bran, *P. farinalis* 98%, and *E. cautella* only 40%. No kernels were capable of germinating after 1 week of feeding by *E. cautella* and *P. interpunctella* and 2 weeks of feeding by *P. farinalis*. Unbroken wheat kernels conditioned to 15.2% moisture content were not attacked by any of the three species, but undamaged kernels conditioned to 21.7% moisture content were successfully attacked by some larvae. Larvae of *E. cautella* feeding on germ and endosperm with or without bran reached the adult, stage in 26 to 32 days; *P. interpunctella*, feeding on the same diet excluding bran, took 12 to 14 days longer than the control to reach the pupal stage. AA

- 3190 MEREDITH (P) and POMERANZ (Y). Inherent amylograph pasting ability of U.S. wheat flours and starches. *Cereal Chem.* 59(5); 1982; 355-60

- 3191 FINNEY (KF), CHUNG (OK), BRUINSMA (BL) and SHOGREN (MD). Effect of type and amount of mixing and quantity of water on inhibitors of yeast activity in wheat flour doughs and slurries. *Cereal Chem.* 59(5); 1982; 385-8

The effect of the type and amount of mixing and the quantity of water differentially influenced the effect of antimicrobial and antimycotic agents on the activity of yeast in dough and on loaf volume of bread. Sorbic acid, an antimycotic agent, greatly inhibited gas production in doughs or slurries of bread ingredients, regardless of the amount

or type of mixing and the amount of water. Monolaurin and monolaurin-plus, antimicrobial agents, had small stimulating rather than depressing effects on yeast activities when diluted in the slurries containing the dough ingredients and 150% water. Even when doughs were manually mixed for 2 minutes, monolaurin and monolaurin-plus inhibited yeast activities only slightly. Yeast activities were materially inhibited by the two microbicides only after the doughs received appreciable mechanical mixing (an important phase of breadmaking). To determine whether a chemical will impair yeast activity in breadmaking, gas production tests should be made on doughs that contain the bread-making ingredients and are mechanically mixed to optimum. AA

- 3192 BRUNISMA (BL) and FINNEY (KF). A gas production formula containing guar or xanthan gum in place of wheat flour. *Cereal Chem.* 59(5); 1982; 402-4

- 3193 SALOVAARA (H). Effect of partial sodium chloride replacement by other salts on wheat dough rheology and breadmaking. *Cereal Chem.* 59(5); 1982; 422-6

The rheological properties of wheat dough were studied when 20, 40, or 100% of sodium chloride (2.0%, flour weight basis) was replaced with an equivalent amount of potassium chloride, magnesium chloride, calcium chloride, magnesium acetate, magnesium sulphate, or sodium sulphate. Farinograph, extensigraph, and rotation viscometer measurements and test baking were applied to doughs containing various salts. At replacement levels of 20 and 40%, magnesium chloride and calcium chloride weakened the physical properties of dough. Whereas magnesium and sodium sulphate strengthened them. Replacement with potassium chloride or magnesium acetate had no significant effect on dough rheology. The peak time and stability value of the farinograms and the extension and extension resistance values of the extensigrams could be arranged in order of the lyotropic series of the corresponding ions. Viscometer flow curves revealed marked differences between chloride, acetate, and sulphate at 100% replacement. When optimum mixing times were used in the baking test, no difficulties in baking performance due to 40% replacement with potassium or calcium chloride or magnesium salts were detected. The flavour of these breads was poor. AA

- 3194 LAMPART-SZCZAPA (E) and JANKIEWICZ (M). Changes in the protein complex of wheat dough affected by soyabean 11 S Globulin: Part 1 - The effects of soyabean 11 S Globulin addition on the technological properties of wheat dough. *Food Chem.* 9(4); 1982; 307-14

The preparation of soyabean 11 S globulin was added to wheaten doughs representing varieties differentiated in their baking qualities, and the changes induced in the protein complex were determined; the multi-step extraction method and baking test were applied. The gluten proteins in the dough of wheat varieties of low breadmaking potential were most affected by soy globulin. A decrease in the contents of the high molecular weight fractions was observed. The disaggregation effect was accompanied by an increase in the contents of proteins dispersible in acetic acid and pyrophosphate buffer. AA

- 3195 NIERLE (W) and EL BAYA (AW). Interactions between proteins and lipids in dough. *Getreide Mehl Brot.* 35(5); 1981; 124-7 (German)

During dough formation, with flour from different varieties of

wheat, the polar lipids were bound in different ways. Addition of DAWE and lecithin as well as the method of kneading also play a role in the way the lipids are bound. Lecithin partially displaces the galactolipids. The exclusion of galactolipids has an unfavourable effect on baked volume, if the amount of phospholipids added is small. This was confirmed by extraction and enzymatic decomposition tests. KMD

- 3196 KNORR (D), WATKINS (TR) and CARLSON (BL). Enzymatic reduction of phytate in whole wheat breads. *J. Food Sci.* 46(6); 1981; 1866-9
- 3197 SWARANJEET (K), MANINDER (K) and BAINS (GS). *Chapaties* with leavening and supplements: Changes in texture, residual sugars, and phytic phosphorus. *Cereal Chem.* 59(5); 1982; 367-72
Yeast leavening, glycerol monostearate, and α -amylase supplements notably improved the texture and flavour of whole meal *chapaties* as compared with the traditional unleavened *chapaties*, which are tough and highly susceptible to staling. Accompanying changes due to leavening in the hydrolysis of phytates and sugars in the *chapaties* are presented. Adjusting the pH to 5.1 - 5.2 with lactic acid had a salutary effect on the reduction of phytates in plain and fermented dough *chapaties*. AA
- 3198 VENKATESWARA RAO (G), SHURPALEKAR (SR), SEIBEL (W) and BRETSCHNEIDER (F). Preservation of *chapati* by heat sterilization. *Getreide Mehl Brot.* 35(5); 1981; 137-9 (German)
The quality of chapatties depends directly on the type of wheat used. Wheats having a high protein content and good gluten quality are somewhat unfavourable. Thus, the variety Caribo showed clearly better results than the variety, Diplomat, both during processing, and in sensory evaluation of the freshly made *chapaties* and of *chapaties* stored for 15 days. Sterilization helps to retain the sensory quality of *chapaties* for a sufficiently long time (15 days, at 26-28 C, 75-80% RH). Foils with adequate water-vapour-proofness must be used for packaging. The temperature and fall in temperature during packaging must be controlled exactly. KMD
- 3199 ABDEL-RAHMAN (A-HY). Effect of cooking time on the quality, minerals and vitamins of spaghetti produced from two Italian durum wheat varieties. *J. Food Technol.* 17(3); 1982; 349-53
Spaghetti was made from two Italian durum wheat varieties and cooked for 10, 15 and 20 minutes. Measurable amounts of soluble nitrogen, starch, minerals and vitamins were found in the water used for cooking. The percentage reduction of minerals increased with increasing cooking time, but trace elements decreased after 10 minutes of cooking and then became stable at the longer times. It is preferable to cook spaghetti for 15 minutes. AA

OAT

- 3200 ZARKADAS (CG). A comparison of the amino acid composition of commercial oat groats. *Cereal Chem.* 59(5); 1982; 323-7
- 3201 BISTON (R) and CLAMOT (G). Use of near-infrared reflectance spectroscopy and dye binding techniques for estimating protein in oat groats. *Cereal Chem.* 59(5); 1982; 333-5

- 3202 MATLASHEWSKI (GJ), URQUHART (AA), SAHASRABUDHE (MR) and ALTOSAAR (I). Lipase activity in oat flour suspensions and soluble extracts. *Cereal Chem.* 59(5); 1982; 418-22

TRITICALE

- 3203 WU (YV). Lysine content of triticale protein increased by germination. *J. Agric. Food Chem.* 30(5); 1982; 820-23

MILLETS

PEARL MILLET

- 3204 ABDUL-HUSSAIN (S) and VARRIANO-MARSTON (E). Amylolysis of pearl millet starch and its fractions by pearl millet alpha-amylase. *Cereal Chem.* 58(5); 1982; 351-5

α -Amylase was isolated from germinated pearl millet and purified by glycogen-amylase complex formation. Germination resulted in a 120-fold increase in specific activity of the enzyme over that of α -amylase from mature grain. Amylolysis of millet starch and its fractions by purified α -amylase was studied by gel filtration. Raw millet starch was resistant to attack by α -amylase from germinated millet. Only limited degradation (26%) occurred after starch was incubated with the enzyme for 24 hours at 35 C. Millet amylose was readily hydrolyzed by purified millet α -amylase. During a 10-minute reaction period at 35 C, 36% of the molecule was degraded to molecular weights of 40,000-10,000. Conversely, some portions of millet amylopectin were hydrolyzed slowly by α -amylase. AA

SORGHUM

- 3205 AISIEN (AO). Utilisation of soluble carbohydrates during sorghum germination and seedling growth. *J. Inst. Brew.* 88(3); 1982; 164-6

- 3206 DOHERTY (C), FAUBION (JM) and ROONEY (LW). Semiautomated determination of phytate in sorghum and sorghum products. *Cereal Chem.* 59(5); 1982; 373-7

Thirty sorghum varieties were analyzed for phytate phosphorus (phytate-P) using a semiautomated method. Phytic acid was isolated by extraction with dilute HCl- Na_2SO_4 and precipitated as Fe(III)-phytate through addition of FeCl_3 . Following precipitation, Fe(III)-phytate was digested utilizing the micro-Kjeldahl procedure to release phytate-P. Phytate-P was determined colorimetrically using a modified Technicon method. Whole sorghums analyzed contained phytate-P levels of 0.17-0.38% (dry weight), accounting for 80-87% of the total phosphorus in the kernel. These levels were comparable to those in other cereals. Highest levels of phytate-P were found in the bran fraction, with lesser amounts in the whole grain and dehulled grain, respectively. The method was employed to quantify phytate-P in wheat, corn, and oilseeds (cottonseed and soyabean flours). Processing effectively concentrated phytate-P levels in both sorghum and corn tortillas, whereas total phosphorus levels (total-P) remained

unchanged. T0, a thick African porridge prepared under acid conditions, had slightly less phytate-P than its parent flour. Overall error for the method was less than 5%. AA

MAIZE

- 3207 DEMIR (I), YUCE (S), KORKUT (C) and MARQUARD (R). Investigations on the fat content, fatty acid composition, and tocopherol content of Turkish maize genotypes, with special attention to the percentages of germ and endosperm. *Getreide Mehl Brot*. 35(4); 1981; 93-6 (German)
- The fat content of Turkish maize grains varied between 4.4 and 6.8%, the content being positively correlated to the percentage of embryo and the fat content of the endosperm. The fat content in the embryo varied between 18.5 and 25.8%, and in the endosperm between 2.1 and 4.3%. Considerable differences were sometimes observed in the fatty acid compositions of the different genotypes; negative correlations existed between the oleic and linoleic acid contents. In the embryo, the linoleic acid content was higher and the linolenic acid content lower than in the endosperm. The total tocopherol content varied between 468 and 138 mg/kg fat, and was negatively correlated with oleic acid content. KMD
- 3208 NAVEH (D), MIZRAHI (S) and KOPELMAN (IJ). Kinetics of peroxidase deactivation in blanching of corn on the knob. *J. Agric. Food Chem.* 30(5); 1982; 967-70
- 3209 BILIADERIS (CG). Physical characteristics, enzymatic digestibility, and structure of chemically modified smooth pea and waxy maize starches. *J. Agric. Food Chem.* 30(5); 1982; 925-30
- The pasting properties, enzymatic digestibility, and fine structure of smooth pea starch (SP), acetylated smooth pea starch (Ac-SP), an acetylated distarch phosphate derivatives of smooth pea starch (AcDP-SP), waxy maize starch (WM), and a hydroxypropyl distarch phosphate derivative of waxy maize starch (HpDP-WM) were investigated. Acetylation decreased syneresis in SP gels. Chemical modification also decreased the susceptibility of the gelatinized AcDP-SP and HpDP-WM to α -amylase action. Structural characterization of the unmodified starches revealed the typical bimodal chain distribution of the amylopectin molecule. Debranching of AcDP-SP and HpDP-WM was incomplete, the debranched chains accounting for only 57-58% of the amylopectin present in the unmodified starches. β -Amylolysis limits of WM, SP, HpDP-WM, and AcDP-SP were 58, 66, 40, and 34% respectively. Chromatography of the debranched AcDP-SP and HpDP-WM before and after β -amylase treatment suggested that acetylation occurred exclusively in certain parts of the granule, whereas hydroxypropylation was more uniform throughout the starch granule. AA
- 3210 ABA(T), ARAI (Y), AMANO (E) and ITOH (T). Role of the recessive amylose extender allele in starch biosynthesis of maize. *Starch*. 33(3); 1981; 79-83
- 3211 BEEMAN (RW), SPEIRS (WE) and SCHMIDT (BA). Malathion resistance in Indian meal moths (Lepidoptera: Pyralidae) infesting stored corn and wheat in the North-Central United States. *J. Econ. Entomol.* 75(6); 1982; 950-54

It was found that 39 of the 43 strains were more than 17-fold resis-

tant to malathion. It is concluded that carboxymethylesterase-type malathion-specific resistance is epidemic in Indian-meal moth populations throughout the US grain belt. KAR

- 3212 BARBIERI (R) and CASIRAGHI (EM). Production of a food grade flour from defatted corn germ meal. *J. Food Technol.* 18(1); 1983; 35-41
A defatted corn germ flour of food, organoleptic and nutritional quality was obtained by applying a milling and screening process to a commercial defatted corn germ meal. The flour contains about 20% protein of good nutritional quality, above 60% starch and minor quantities of fat (1.7%), fibre (3.3%) and minerals (8.42%). The last are interesting for their content in potassium, magnesium, iron and zinc. Heat effects on protein were evaluated in the intermediate and final products of a commercial oil extraction installation. It was found that the conditioning step sharply decreased protein solubility, while protein digestibility remained substantially constant throughout the process. AA
- 3213 PADUA (GW) and WHITNEY (RMCL). Application of the Instron Tester for investigation of rheology of corn dough. *Cereal Chem.* 59(5); 1982; 361-6
The expression for the deformation of a short cylinder of corn dough between parallel plates under constant load was derived and applied to the behaviour of corn dough in the compression cell of the Instron Tester (model TM-M; tension cell, CTM). The results demonstrated that corn dough behaved as a Bingham plastic. When the mixing time is 15 minutes or more, the holding time 12 hours or more, and the moisture content carefully controlled, 5-7% precision can be obtained in the evaluation of the Bingham viscosity and yield values if the moisture content is 53% or more. AA
- 3214 PAREDES-LOPEZ (O) and MORA-ESCOBEDO (R). Influence of storage on the quality of maize meal for tortilla making. *J. Food Technol.* 18(1); 1983; 53-60
The aim of this work was to study changes in the quality of limed maize meal for tortilla making during accelerated storage conditions. The limed meal was stored at four relative humidities (55, 62, 75 and 83%) for 10 to 90 days, using a storage temperature of 35 C. The parameters, fat acidity, insoluble residue protein, available lysine, *in vitro* digestibility and protein efficiency ratio were investigated. Major alterations of these parameters suggested that storage had profound effects on the meal quality. Sensory attributes of tortillas prepared with the stored meal further confirmed that storage was responsible for quality deterioration. AA

PULSES

- 3215 JAIN (HK). New production technology of pulses. *East Econ.* 78(3); 1982; 127, 129, 130-31
- 3216 SHANKARA RAO (DS) and DEOSTHALE (YG). Mineral composition of four Indian food legumes. *J. Food Sci.* 46(6); 1981; 1962-3
- 3217 EL TINAY (AH), EL HARDALOU (SB) and NOUR (AM). Comparative study of three legume starches. *J. Food Technol.* 18(1); 1983; 1-9
Starch content of chickpea (*Cicer arietinum*), pigeon pea (*Cajanus*

cajan) and bonavist bean (*Dolichos lablab*) was 58, 52 and 50% respectively with recovery of 57.9, 48.1 and 49.0%. The amylose content was 33.5, 27.0 and 31.0%; amylose chain length was 1420, 550 and 830 glucose units and amylopectin chain length was 29, 27 and 28 glucose units for chickpea, pigeon pea and bonavist bean respectively. Chickpea starch granules ranged from large oval shaped (21 x 30 μ m) to small spherical (13 μ m in diameter); pigeon pea from (35 x 42 μ m) to 15.2 μ m and bonavist bean (35 x 42 μ m) to 15.2 μ m. The gelatinization temperature range was 67-76 C for chickpea, 71-78 C for pigeon pea and 78-80 C for bonavist bean starch. The swelling power for chickpea, pigeon pea and bonavist bean at 95 C were 17, 18.5 and 22.5% respectively. The legumes showed a single-stage and somewhat restricted swelling. Solubility curves for legume starches showed a similar pattern and indicated that they have higher solubility at elevated temperatures than wheat starch. The liquefaction characteristics showed that chickpea has the highest resistance to cooking and was the most sensitive to α -amylase. The three legume starches gave stabilized Brabender hot-paste viscosity; chickpea had a lower overall viscosity due to its exceptionally long amylose chains. AA

- 3218 PATTEE (HE), SALUNKHE (DK), SATHE (SK) and REDDY (NR). Legume lipids. *CRC Crit. Rev. Food Sci. Nutr.* 17(2); 1982; 97-139

Discusses: Chemistry of legume lipids; lipid derived flavours and off flavours; food technology and legume lipids; and nutritional and health importance. BSN

- 3219 REDDY (NR), PIERSON (MD), SATHE (SK) and SALUNKHE (DK). Legume-based fermented foods: Their preparation and nutritional quality. *CRC Crit. Rev. Food Sci. Nutr.* 17(4); 1982; 335-70

Discusses: soy sauce, tempeh; meitanza; miso; natto; fermented soya-bean milk and other fermented legume milk products; kenima; oncom (fermented peanut press cake); waries; papadams; dhokla; khaman; idli; dawa-dawa; and other legume fermented foods. BSN

- 3220 AUGUSTIN (J), BECK (CB), KALBFLEISH (G), KAGEL (LC) and MATTHEWS (RH). Variation in the vitamin and mineral content of raw and cooked commercial *Phaseolus vulgaris* classes. *J. Food Sci.* 46(6); 1981; 1701-6

Raw and cooked samples of nine different commercial classes of the *Phaseolus vulgaris* L. species were analyzed for their contents of five water-soluble vitamins and nine-minerals. On a 100 g dry weight basis, the mean vitamin and mineral values of the raw bean samples amounted to the following: thiamin 0.99 mg, riboflavin 0.20 mg, niacin 1.99 mg, vitamin B₆ 0.49, folic acid 0.30 mg, phosphorus 0.46 g, sodium 10.3 mg, potassium 1.54 g, calcium 0.15 g, magnesium 0.20 g, zinc 3.2 mg, manganese 1.4 mg, copper 0.91 mg, and iron 5.84 mg. With a few exceptions variabilities of these nutrients between bean classes exceeded those within classes. Nutrient variabilities in cooked samples, again with a few exceptions, were higher than in the corresponding uncooked material. Retention values of water-soluble vitamins during cooking between bean classes averaged between 70 and 75%. Retention of minerals during cooking ranged from a low of 38.5% for sodium to total retention for calcium, with the majority of the minerals falling into the 80-90% level. AA

PEA

- 3221 MORFAUX (JN), ALBAGNAC (G) and TOUZEL (JP). Methane fermentation of waste waters from the blanching of peas - Continuous-flow, bench-scale studies. *Sci. Aliment.* 1(2); 1981; 293-314 (French)

The anaerobic treatment of medium-strength waste water obtained from the blanching of peas could be accomplished successfully and at reasonable organic loading rates only in a continuous-flow, completely-mixed digester with sludge recirculation. Treatment efficiency was higher than 95% and the maximum organic load (food/micro-organisms ratio) was 0.6 kg COD/kg VSS day. However, the maximum organic loading rate attained in these experiments was around 5 kg COD/m³ day, due to a very inefficient sludge recirculation. Maximal gas production attained was 1.3 m³ methane per m³ digester per day. Studies performed on the acidification step of this peculiar waste have led the authors to a reconsideration of the concept of two-phase anaerobic digestion. KMD

GRASS PEA

- 3222 MISRA (BK), SINGH (SP) and BARAT (GK). Ox-dapto: the *Lathyrus sativus* neurotoxin. *Qualitas Plantarum*. 30(3/4); 1981; 259-70

The present knowledge of the neurotoxin in *Lathyrus sativus* is summarized, the involvement of the toxin in causing neurolathyrism in humans discussed, and future research needs suggested. AA

BLACK BEAN

- 3223 SILVA (AB), BATES (RP) and DENG (JC). Influence of soaking and cooking upon the softening and eating quality of black beans (*Phaseolus vulgaris*). *J. Food Sci.* 46(6); 1981; 1716-20, 1725

Soaking and cooking treatments were evaluated to establish the relationship of various regimes to the development of cooked bean texture and flavour of black beans (*Phaseolus vulgaris* L.). A salt combination soaking solution was most effective in promoting bean softening during cooking, compared to no soaking or a distilled water soak. A high correlation was observed between objective and sensory texture scores. An Instron puncture force of 150 g (0.14 cm probe, 5 cm/minute) accurately defined the "eating-soft" limit of texture acceptability. AA

- 3224 SILVA (CAB), BATES (RP) and DENG (JC). Influence of pre-soaking on black bean cooking kinetics. *J. Food Sci.* 46(6); 1981; 1721-5

Soaking of black beans (*Phaseolus vulgaris* L.) and the subsequent effect on cooking kinetics was investigated. Unsoaked beans and beans soaked in water or a salt combination solution were water cooked at temperatures of 90-135 C. Bean softening did not follow first order kinetics. Using D_T values (defined as cooking times necessary to reach an "eating-soft" texture: Instron puncture force of 150 g), softening activation energies (E_a 's) for unsoaked, water, and salt combination soaked were 19.1, 31.3, and 38.9 Kcal/mole, respectively. Z values were calculated as 17, 22 and 36 C, respectively. These relationships suggest ways of safely reducing cooking time and energy expenditures. AA

DRY BEAN

- 3225 DESHPANDE (SS), SATHE (SK), CORNFORTH (D) and SALUNKHE (DK). Effects of dehulling on functional properties of dry bean (*Phaseolus vulgaris* L.) flours. *Cereal Chem.* 59(5); 1982; 396-401
 Water and oil absorption capacities of dry bean (*Phaseolus vulgaris*) flours increased, as a result of milling by 3-39% and 10-44% respectively. Dehulling also resulted in increased foaming and emulsion characteristics. Most of the seed cultivars on seed coat removal showed improved gelling properties. Among the cultivars studied, small white beans showed very good water absorption, gelling and emulsion properties. Maximum increase in whipping volume was observed with Black beauty and cranberry flours whereas foams from dark red kidney beans were the most stable. BSN
- 3226 ANDREOTTI (R), TOMASICCHIO (M), MACCHIAVELLI (L) and ARCAMONE (F). Chemico-nutritional factors in dry and canned rehydrated beans. *Ind. Conserv.* 56(4); 1981; 254-8 (Italian)
 The contents of phosphorus, potassium, protein, aminoacids and starch were determined in different varieties of dry beans with white seeds (Cannellino, Bianco di Spagna, Alubia, Corona) and with brown mottled seeds (Ania, Pinto, Taylor, Cranberry, Barlotto). The same analyses were performed during the various steps of industrial processing and on the final products obtained by the conventional canning technique and by vacuum canning. The nutritional quality of the final products was also evaluated. The vacuum canned beans proved better than their conventionally canned counterparts. AA

FABA BEAN

- 3227 RAUSCHAL (EJ), LINOW (K-J), PAHTZ (W) and SCHWENKE (KD). Chemical modification of proteins. Part 8. Effect of succinylation on physicochemical and functional properties of proteins from faba beans. *Nahrung.* 25(3); 1981; 241-8 (German)
 A raw globulin preparation - composed of legumin and vicilin from faba beans (*Vicia faba* L.) dissociates after succinylation of the amino groups into subunits, which appear in ultracentrifugation as on 2.8-S fraction. In the gel electrophoretic patterns of modified protein, the associated form of globulin is not detectable already after blocking of 3.7% of the protein amino groups; the protein patterns of highly modified samples show at least 6 zones. The solubility minima of the succinylated proteins are shifted to lower values of pH depending on the degree of modification; the solubility is decreased in the range of pH <4.1. Moderately (27%) modified proteins show an increase of water and oil adsorption capacity of 25% and 40% respectively. In higher modified samples, the oil adsorption is decreased to 80 and 60% of the control. The emulsifying properties (emulsifying capacity, emulsifying activity, emulsion stability) can be improved substantially by succinylation. AA
- 3228 SCHMANDKE (H), BIKBOV (TM), BELAVTSEVA (EM), RADSCHENKO (LG), MAUNE (R), SCHULTZ (M), GRINBERG (VYA) and TOLSTOGUZOV (VB). On the gelation of *Vicia faba* protein in dependence on the acetylation degree. *Nahrung.* 25(3); 1981; 263-9

Using the method of mathematical planning of experiments and taking the shear modulus of the gels as an equivalent of the gelation degree, the conditions of the thermal denaturation at the maximum shear modulus were found to be T_D 100 C and t_D 60 minute for the non-acetylated *Vicia faba* protein and T_D 100 C and t_D 40 minutes for the acetylated *Vicia faba* protein. Under these conditions, the dependence of the shear modulus (G) on the protein concentration (C) is expressed by exponential functions $G = \alpha.C^{4.3}$ and $G = \alpha.C^{5.0}$ respectively. By increasing acetylation of the *Vicia faba* protein, the shear modulus, the thickness of the chains and the net density of gels are increased; the same is valid for the shear modulus and the masking of disulphide groups by an increasing concentration of nonacetylated and acetylated *Vicia faba* proteins. AA

FIELD BEAN

- 3229 SALIMATH (PV) and THARANATHAN (RN). Carbohydrates of field bean (*Dolichos lablab*). *Cereal Chem.* 59(5); 1982; 430-35

Field bean endosperm sugars soluble in 70% ethanol were D-glucose, D-galactose, D-fructose, sucrose, raffinose, stachyose, and verbascose. The endosperm was composed principally of starch, whereas the hulls were rich in dietary fiber components. *In vitro* digestion of the native starch granule by glucoamylase and salivary α -amylase revealed characteristic enzyme degradation patterns in scanning electron microscopy. Glucoamylase digestion of a granule resulted in typical onion-type layering, unlike α -amylase digestion, which resulted in depressions and selective opening of the granule. Hot water soluble gum from the endosperm was a noncellulosic β -D-glucan. A cold water soluble fraction from the hulls was identified as a mixture of arabinogalactans; a hot water soluble fraction was found to be a composite aggregate of water-soluble gums and pectic fractions. Pectic fractions from the hulls had gelling characteristics that were superior to those from the endosperm. Hemicellulose A from the hulls was an amyloidtype polysaccharide, and hemicellulose B was either a glucomannan-type polysaccharide or a mixture of a glucomannan and a cellulosic β -D-glucan. Glucose was the predominant sugar in hemicelluloses A and B of the endosperm. Alkali-insoluble residue from the endosperm was a macromolecular aggregate of pentosans and cellulose, whereas that from the hulls was composed of cellulose. AA

- 3230 LUDWIG (E), KRAUSE (W), NOTZOLD (H) and TEBLING (F). Enzymatic modification (plastein synthesis) of field bean protein. *Nahrung.* 25(3); 1981; K15-K7 (German)

Enzymatic modification of unconventional proteins might improve the functional properties or aminoacid composition of the said proteins; or reduce their off-flavour. Of particular interest, in this connection, is the converse of proteolytic splitting, or, in other words, the synthesis of insoluble, gel-forming plasteins. Hence, the hydrolysis of field bean (*Vicia faba*) protein isolate by pepsin was studied. The plasteins obtained were pale yellow in colour, and neutral in odour and taste. They are formed even by enzyme preparations that do not have a marked proteolytic activity, and notably by β -lactoglobulin which is not an enzyme, but functions, apparently, only as a matrix. KMD

GREAT NORTHERN BEAN

- 3231 SATHE (SK) and SALUNKHE (DK). Functional properties of the great northern bean (*Phaseolus vulgaris* L.) proteins: sorption, buffer ultraviolet, dielectric, and adhesive properties. *J. Food Sci.* 46(6); 1981; 1910-13
- 3232 SATHE (SK), IYER (V) and SALUNKHE (DK). Investigations of the great northern bean (*Phaseolus vulgaris* L.) starch: Solubility, swelling, interaction with free fatty acids, and alkaline water retention capacity of blends with wheat flours. *J. Food Sci.* 46(6); 1981; 1914-7

WINGED BEAN

- 3233 EKPENYONG (TE) and BORCHERS (RL). Amino acid profile of the seed and other parts of the winged bean. *Food Chem.* 9(3); 1982; 175-82
- The protein content in the seeds is similar to that of soyabean, while the roots have protein level higher than that of any known tropical root crop. High amounts of lysine and threonine with total essential amino acids similar or even superior to that of soyabeans was observed in different parts of winged bean. All the different parts show good quality protein which can be utilised in supplementing cereal-based diets. KAR

OILSEEDS AND NUTS

- 3234 CHHATRAPATI (AC). Trends in oilseeds production in India. *Oleagineux.* 36(10); 1981; 509-14 (French)
- Oilseeds output shows an increase of only 60 per cent over the First-Five Year Plan average. The prime source of this growth has been increase in area. Yield levels of oilseeds have been stagnant for nearly five decades. This article aims to review the trend in our oilseeds production in the overall context of supply and demand for edible oils. AA
- 3235 McLELLAN (KM) and ROBINSON (DS). Heat stable peroxidase isoenzymes in *Brassica* species. *IFST Proc.* 15(3 Pt.1); 1982; 129-35
- 3236 FENWICK (GR), HEANEY (RK) and MULLIN (WJ). Glucosinolates and their breakdown products in food and food plants. *CRC Crit. Rev. Food Sci. Nutr.* 18(2); 1982; 123-201
- Discusses: glucosinolates; myrosinase (Thioglucoside glucohydrolase, EC 3:2:3:1) and its effect; analysis, importance of *Brassica* groups; distribution of glucosinolates; glucosinolates and flavour; factors affecting flavour; effects of glucosinolates and breakdown products in foods; indirect effects in the food chain; and effects of glucosinolates and breakdown products in animal feeding stuffs. BSN
- 3237 BASSLER (R). Experiences with the examination of feeds and some oilseeds for aflatoxin. *Qualitas Plantarum.* 30(3/4); 1981; 271-82
- 3238 CHIMIROV (YI), SOLOGUB (LP), BRAUDO (EE), KOZMINA (EP) and TOLSTOGUZOV (VB). Utilization of structurized oilseed proteins in minced meat products. *Nahrung.* 25(3); 1981; 255-62

The effect of protein isolate mixtures of sunflower and soyabean seeds on the structural and mechanical properties and the biological value indices of chopped meat products has been studied. The possibility of using the structurized oilseed proteins in chopped meat products at the rate of 30-50 percent has been shown. AA

- 3239 KUNDU (MK). Chromatographic detection of silicones in vegetable oils. *Fette Seifen Anstrichm.* 83(4); 1981; 155-6

The method is based upon separation of silicone in the oil by thin layer chromatography on silica gel, using the solvent system petroleum ether diethyl ether = 98:2 (v/v) and visualisation of the spots developed by means of Rhodamin B reagent. Under the described conditions, separation of silicones seems to be free from interference from other non-silicone containing materials. The limit of detection was approximately 2%. AA

- 3240 CHAKRAVARTY (T), BHATIA (S) and SARAF (DN). A simulation study of industrial vegetable oil hydrogenation reactors. *J. Am. Oil Chem. Soc.* 59(4); 1982; 157-61

A mathematical model has been developed to predict the course of industrial vegetable oil hydrogenation reactors. The model assumes that the reaction is mass-transfer-controlled. Suitable empirical equations have been used to describe rate of hydrogenation in preference over a mechanistic approach. The agreement between theoretical predictions from the model and plant data is generally satisfactory. Temperature, pressure and agitation intensity have strong effect on the kinetics of the reaction and on selectivity ratio under conditions of industrial reactors. The product quality is determined by overall selectivity which is governed by operating conditions, as well as the catalyst selectivity. AA

COTTONSEED

- 3241 HRON (RJ) Sr., KOLTUN (SP) and GRACI (AV) Jr. Suitability of commercial cottonseed for producing edible high protein flours by liquid classification. *J. Am. Oil Chem. Soc.* 59(5); 1982; 233-7

This study shows that hulled cottonseed kernels containing FG (Free Gossypol) levels of $\leq 1.10\%$, when processed through the LCP (Liquid Cyclone Process), yield an edible, high-protein flour. VR

- 3242 ZARINS (ZM) and CHERRY (JP). Storage proteins of glandless cottonseed flour. *J. Food Sci.* 46(6); 1981; 1855-9; 1862

- 3243 CHERRY (JP) and GRAY (MS). Methylene chloride extraction of gossypol from cottonseed products. *J. Food Sci.* 46(6); 1981; 1726-33

Methylene chloride was used to reduce the amount of free and total (free plus bound) gossypol in hexane-defatted meal and the liquid-cyclone-processed (LCP) underflow fraction of glanded cottonseeds from 2.6% and 3.4% to 0.013% and 0.15% respectively (the accepted level of free gossypol in cottonseed products for food is 0.045%).

The cottonseed meals were pretreated one of three ways to rupture the gossypol glands: (a) equilibrated with additional water; (b) suspended in various water-propylene glycol mixtures; or (c) mixed with an acetic acid-water-propylene glycol solution. The gossypol was then readily

extracted from the meals with methylene chloride. Low levels of water and acetic acid in propylene glycol aided methylene chloride in the removal of free and total gossypol and did not greatly alter the proximate composition, solubility, and gel electrophoretic properties of proteins; amino acid content; and chemical scores of the treated meals. Success with this process should improve the potential of LCP-cottonseed by-product (under-flow) as feed or food. AA

LINSEED

- 3244 DORRELL (DG). Factors affecting the ability of linseed (*Linum usitatissimum* L.) meal to form stable meal-water suspensions. *Fette Seifen Anstrichm.* 83(4); 1981; 136-9

JOJOBA

- 3245 SHANI (A). Functionalization at the double bond region of jojoba oil: II. Diels-Alder adducts of jojobatetraene. *J. Am. Oil Chem. Soc.* 59(5); 1982; 228-30

LUPIN

- 3246 ORTIZ (JGF) and MUKHERJEE (KD). Extraction of alkaloids and oil from bitter lupin seed. *J. Am. Oil Chem. Soc.* 59(5); 1982; 241-4

MUSTARD

- 3247 HENNING (W). Determination of mustard-oil glucosides and their decomposition products in mustard seeds and table mustard preparations by means of ion-pair high performance liquid chromatography. *Dtsch. Lebensmittel-Rundschau.* 77(9); 1981; 313-8 (German)

For determination of glucosinabin, singrin and its decomposition products a rapid and little expensive HPLC method is described. Separation was performed on reversed phase (C₁₈) material with ion-pair chromatography using tetraheptyl ammonium bromide as counter ion. Application of the method is tested by two samples of mustard seeds and mustards. Approximately 100% recovery and results with variations of max $\pm$ 3.7% for mustard seed, max $\pm$ 18% for mustard were obtained. AA

RAPESEED

- 3248 MARQUARD (R) and SCHUSTER (W). Changes in seed ingredients of various rapeseed varieties under controlled climatic conditions. *Fette Seifen Anstrichm.* 83(3); 1981; 99-106 (German)

By phytotron tests with winter and summer rapeseed varieties, the influence of temperature, photoperiod and atmospheric humidity on various ingredients was investigated. Fat and protein contents were very significantly influenced by the vegetation temperature, as the increase in temperature, lowers the fat content and increases the protein content. Considering the influence of climatic conditions on the fatty acid

pattern, it is to be differentiated whether it is a question of old varieties with high or new varieties with low erucic acid content. AA

- 3249 SIY (RD) and TALBOT (FDF): Preparation of low-phytate rapeseed protein by ultrafiltration: 1. The aqueous extraction of phytate from deoiled rapeseed meals. *J. Am. Oil Chem. Soc.* 59(4); 1982; 191-4

The extraction of phytate and nitrogen- and phosphorus-containing compounds from Tower and Candle variety rapeseed meal and flour using aqueous sodium chloride solution has been investigated. Single-stage extraction experiments were made varying the v/n ratio from 10 to 500 mL of extract solution per g of sample and using an extract solution containing 0-10% (w/v) sodium chloride. The pH of the extract solution was varied from 3.0 to 10.0. It was found that phytate and phosphorus-containing compounds can be completely extracted whereas the extent of extraction of nitrogen-containing compounds ranged from 27 to 75% and depended on the extent of protein denaturation of the sample. The above observations were found to be independent of the pH of the extract solution. The extraction method is viewed as a first step in the membrane preparation of a low-phytate rapeseed protein. AA

- 3250 SCHWENKE (KD), RAAB (B), LINOW (K-J), PAHTZ (W) and UHLIG (J). Isolation of the 12S globulin from rapeseed (*Brassica napus* L.) and characterization as a "neutral" protein. On seed proteins. Part 13. *Nahrung*. 25(3); 1981; 271-80

An isolation procedure for the 12S rapeseed globulin is described which includes precipitation by dialysis, purification using gel chromatography on Sephadex G-200, and ion-exchange chromatography on DEAE. Sephadex A-50. The isolated globulin represents a neutral protein with an isoelectric point at pH 7.25 determined by isoelectric focusing and a ratio of the acidic to basic amino acid residues (Σ Glu, Asp - Amide ammonia: Σ Arg, Lys, His), of 1.0. As in other storage globulins, high contents of glutamic (19%) and aspartic (10%) acid and a low content of sulphur containing amino acids are characteristic for the amino acid composition. Amongst the basic amino acids, arginine has the higher percentage (7%). Contrary to the results of other authors the sugar content of the globulin is low (0.5%). From the amino acid composition, an average hydrophobicity according to Bigelow was calculated which amounted to 1041 cal/res. (4.36 KJ/res). AA

- 3251 SHAH (BG), BENNS (G), NERA (EA), VERDIER (PC), BEARE-ROGERS (JL), JONES (JD), OHLSON (R) and ANJOU (K). Iodine metabolism and tissue mineral levels in rats fed rapeseed protein concentrates supplemented with zinc. *Qualitas Plantarum*. 30(3/4); 1981; 234-43

A 16-week feeding test of Tower (*Brassica napus*) and Span (*Brassica campestris*) rapeseed protein concentrates (RPC) was carried out on male and female Charles River CD (Sprague-Dawley) weanling rats. The diets contained 10% or 20% protein (N x 6.25) from each RPC and were supplemented with 150 mg zinc/kg. The control groups received a purified diet with casein or a laboratory chow diet. The results of the test diet groups did not reveal any adverse effect due to RPC on thyroid metabolism or the metabolism of zinc, iron, copper, manganese, calcium, phosphorus, and magnesium. Nephrocalcinosis was observed in all female rats that were fed the test diets and the casein control diet, and therefore it could not be attributed to dietary RPC. AA

- 3252 SHAH (BG), NERA (EA), VERDIER (PC), BEARE ROGERS (JL), JONES (JD), ANJOU (K) and OHLSON (R). Growth, blood chemistry and histology of rats fed zinc supplemented rapeseed protein concentrates. *Qualitas Plantarum*. 30(3/4); 1981; 223-33

No significant differences were observed in organ weights including thyroids, haematology, bone marrow differential counts, serum glucose, urea nitrogen, total protein, albumin/globulin ratio, cholesterol, transaminases or alkaline phosphatase. The levels of serum vitamins A and E of females fed some of the rapeseed protein concentrate (RPC) diets were less than in those fed the casein control diet, but equal to those in females fed laboratory chow diet. Females fed either RPC or casein in the semi-purified diets, which contained zinc oxide, exhibited kidney calcification. VR

- 3253 SINHA (RN), MILLS (JT), WALLACE (HAH) and MUIR (WE). Quality assessment of rapeseed stored in ventilated and non-ventilated farm bins. *Sci. Aliment.* 1(2); 1981; 247-63

The ventilated system consisted of a 560-Watt, 3450-r.p.m. fan, a perforated duct, a thermostat, and a humidistat installed in a steel bin of 550 cm diameter, and holding 34-45 tonnes of rapeseed. A similar, non-ventilated bin served as the control. The criteria measured were: moisture content (MC), temperature, fat acidity, O₂, CO₂, conductivity, mites, insects, and microflora. When rapeseed of 6.3-7.2% MC was stored, temperature was 10 C lower in the ventilated bin than in the non-ventilated bin, during the experimental period December-February, in two consecutive winters; the differences observed in the other variables were negligible. When rapeseed of 8.8-12.8% MC was stored, the temperature in the ventilated bin was lower by 10-15 C during the December-February period, and MC was also reduced by about 2%; hence, there was a reduction in the growth and multiplication of microflora and arthropod pests. Turning of bulk rapeseed in October eliminated isolated damp pockets in both the bins. At the end of the experiment, the mean MC of the material in the non-ventilated bin was an unsafe 9.8%, while that of the material in the ventilated bin was a safe 7.5%. Statistical discrimination analysis showed that MC, temperature, *Gonatobotrys* and *Alternaria*, as well as insects, mites, and conductivity can be used for discrimination. KMD

- 3254 ITOH (T), KOMAGATA (H), TAMURA (T) and MATSUMOTO (T). Trans-22-dehydrocholesterol and stigmasta-5, 25-dienol in *Brassica napus* seed oil. *Fette Seifen Anstrichmittel*. 83(3); 1981; 123-5

Three minor sterols found in the sterol fraction separated from the unsaponifiable matter of *Brassica napus* (cruciferae) seed oil are identified as trans-22, dehydrocholesterol, stigmasta-5, 25-dienol and fucosterol. The former two are regarded indeed as the natural products, but fucosterol seems to be the artefact formed by isomerization from 28-isofucosterol, which occurs as one of the abundant sterol constituents of the fraction during the extensive separation procedures by argentation thin layer chromatography. AA

SAL SEED

- 3255 SENGUPTA (S), GHOSH CHOWDHURY (P), CHAKRABARTY (MM) and BHATTACHARYYA (DK). Detoxification of sal seed (*Shorea robusta*) meal. *Fette Seifen Anstrichmittel*. 83(4); 1981; 152-4

The removal of tannin from sal meal with a minimum loss of other meal components e.g. protein and starch, was tried with a number of solvent systems. The effects of different variables e.g. temperature, time of extraction and pretreatment involving steaming and cooking at different pressures and for different time intervals were investigated. It was found that cooking at 10 psig for 30 minutes followed by extraction with 90% ethanol effectively removed tannin from sal meal by about 87%. The solid matter loss to the extent of 10% was due to starch. AA

SESAME

- 3256 MOHARRAM (YG), MOUSTAFA (AM) and OSMAN (HOA). Studies on wet dehulling of Egyptian sesame seeds by lye solutions. *Food Sci. + Technol.* 14(3); 1981; 137-40

A lye solution was used to dehull five sesame seed varieties namely Giza 23, Giza 24, Giza 25, Strain 22/4, and Sudany. It was found that 6% NaOH at 60 C with seed to lye ratio of 1:3 (w/v) was sufficient to decorticate all sesame seed varieties in 10 seconds. However, the Giza 24 variety required a ratio of lye solution to seed of 12:1 v/w at 60 C to obtain satisfactory dehulling in 10 seconds. There was no appreciable loss in both protein and oil contents due to dehulling with NaOH solution. The treatment improved kernel colour. AA

SOYABEAN

- 3257 WOLF (RB), CAVINS (JF), KLEIMAN (R) and BLACK (LT). Effect of temperature on soyabean seed constituents: oil, protein, moisture, fatty acids, amino acids and sugars. *J. Am. Oil. Chem. Soc.* 59(5); 1982; 230-32
- 3258 SAIO (K), KOBAYAKAWA (K) and KITO (M). Protein denaturation during model storage studies of soyabeans and meals. *Cereal Chem.* 59(5); 1982; 408-12

Protein denaturation of soyabeans and meals as a function of storage time and conditions was studied. As storage time under improper conditions increased, protein extractability decreased rapidly. Extractability was influenced by high ionic strength and pH but was most affected by the presence of dithiothreitol. Extractabilities of 7S and 11S components decreased, indicating an even more rapid decrease of the 11S component. Hence, in the relative proportion of extractable protein from defatted meals, 11S components decreased, and 2S components increased. Such changes in proteins were investigated by ultracentrifugation and electrophoresis. Whole beans were more resistant to deterioration during storage than meals, and full-fat meals deteriorated more rapidly than defatted meals. Quality seems to be more readily retained in the native state when the intracellular membranes are intact. AA

- 3259 GERMAN (B), DAMODARAN (S) and KINSELLA (JE). Thermal dissociation and association behaviour of soy proteins. *J. Agric. Food Chem.* 30(5); 1982; 807-11
- 3260 ARMSTRONG (DJ), RICHERT (SH) and REIMANN (SM). The determination of isolated soyabean protein in raw and pasteurized meat products. *J. Food Technol.* 17(3); 1982; 327-37

Sodium dodecyl sulphate-polyacrylamide gel electrophoresis was used to determine the isolated soy protein content in raw and pasteurized meat products. This method determined soy protein ($\pm 0.5\%$) by using an internal standard protein(haemocyanin) to compensate for variations in the meat. The detection limit for meat products was 0.5%. Several possible meat and non-meat interferences were examined and none were found to interfere. The assay cannot be used on retorted products. AA

- 3261 BAIRD (DG). The effect of heat and shear on the viscoelastic properties of soy flour dough. *J. Food Process. Eng.* 5(4); 1982; 231-45

The changes in rheological properties of dough was followed using cone-and-plate, plate-plate and capillary rheometers to shear and heat. It was observed that only in the higher moisture dispersions ($> 50\%$ moisture) were there any signs of an increase in rheological properties which might be associated with cooking. It was concluded that cooking of soy flour doughs most likely does not involve the formation of a permanent network formed by covalent chemical bonds. KAR

- 3262 TSAI (SJ), LAN (CY), KAO (CS) and CHEN (SC). Studies on the yield and quality characteristics of tofu. *J. Food Sci.* 46(6); 1981; 1734-7, 1740

SUNFLOWER

- 3263 STERN (P) and CMOLIK (J). Rheological properties of sunflower margarine. *Fette Seifen Anstrichmittel.* 83(4); 1981; 144-7 (German)

COCONUT

- 3264 BANZON (JA). The coconut as a renewable energy source. *Oleagineux.* 36(10); 1981; 487-92

The coconut in the Philippines, is shown to be a renewable energy source of large magnitude. The energy contained in the 1978 harvest of over 12 billion nuts is calculated of equal 31×10^{12} kilocalories considering only the energy in the husk and shell; this is equivalent to 3.8 billion liters of gasoline. Each of the existing 377 million trees, whether bearing or not, sheds one leaf per month; the petiole of each leaf weighs 2.17 kg dry. Energy from these petioles is calculated to be 39×10^{12} kilocalories, a value even larger than that from husk and shell because of so many non-bearing trees. Considering a "standard" coconut plantation of 150 trees/hectare and bearing 10,000 nuts/year, the calculated energy from the shell, husk and petiole amounts to 54.5 million kilocalories. For other sizes of nut harvests, $E = 2.6 N + 15.6$ where N is in thousand nuts and E is in million kilocalories. If only husk and shell are considered, $E = 2.6 N$. Shell, husk and petiole may be converted to charcoal, but with an energy loss of about 50 percent; the latter is partly recoverable by using as fuel the noncondensable gases evolved during charcoaling. AA

- 3265 PHAM (CB) and DEL ROSARIO (RR). The preparation of protein hydrolysate from defatted coconut and soyabean meals. I. Effect of process variables on the amino nitrogen released and flavour development. *J. Food Technol.* 18(1); 1983; 21-34

Using 6 N hydrochloric acid (HCl), the complete hydrolysis of soya-

bean meal was reached after 36 hours at 95 C, while it took only 24 hours to complete the process when 18 N sulphuric acid (H_2SO_4) was used at the same temperature. Coconut protein exhibited some degree of resistance to hydrolysis. Using 10 N HCl and 18 N H_2SO_4 in two separate tests, it took 48 hours to complete hydrolysis at 95 C. Sulphuric acid caused a considerably greater decomposition of amino acids than HCl during longer periods of reaction with high acid concentration and temperature. Flavour development is a function of the free amino acids released which in turn is a function of acid concentration, reaction time and temperature. AA

GROUNDNUT

- 3266 ZAMBETTAKIS (C), WALIYAR (F), BOCKELEEE-MORVAN (A) and de PINS (O). Results of four years of research on resistance of groundnut varieties to *Aspergillus flavus*. *Oleagineux*. 36(7); 1981; 377-85
- The resistance of about 40 varieties of groundnut to contamination by *Aspergillus flavus* in the field has been studied over a 4-year period (1976-1980) in Senegal. A Senegalese variety of proved agronomic value, viz. 55-437, had a resistance nearly equally to the standard resistant variety PI 337-409. Two other varieties, 73-30 and 73-33, also showed a favourable behaviour, and can be regarded as tolerant to *A. flavus*. KMD
- 3267 MEHAN (VK), Mc DONALD (D), NIGAM (SN) and LALITHA (B). Groundnut cultivars with seed resistant to invasion by *Aspergillus flavus*. *Oleagineux*. 36(10); 1981; 501-5
- One Indian commercial cultivar J 11 and two groundnut lines PI 337409 and PI 337394 F were found resistant to invasion and colonisation by *A. flavus* of intact, dried seeds when these were rehydrated and inoculated with Indian strains of the fungus. Storage of seeds for periods of 55, 70 and 90 days before testing did not significantly affect the results. Inoculation of seeds of seven cultivars with three different toxigenic strains of *A. flavus* showed marked differences in invasive potential between cultivars. The strain NRRL 3000 was less virulent than the other two on all cultivars. The cultivar J 11, which also shows resistance to pod rots, could be useful in areas where aflatoxin contamination is a serious problem. AA
- 3268 FRANCIS (OJ) Jr., LIPINSKI (LJ), GAUL (JA) and CAMPBELL (AD). High pressure liquid chromatographic determination of aflatoxins in peanut butter by using a silica gel-packed flowcell for fluorescence detection. *J. Assoc. Off. Anal. Chem.* 65(3); 1982; 672-6
- 3269 FARDIAZ (D) and MARKAKIS (P). Oligosaccharides and protein efficiency ratio of oncom (Fermented peanut press cake). *J. Food Sci.* 46(6); 1981; 1970-71

HAZELNUT

- 3270 FINCKE (A). Investigations on the composition of hazelnut kernels, and sweet almonds of different origins. *Gordian*. 81(11); 1981; 253-6 (German)
- The following analytical data on hazelnut kernels and sweet almond kernels have been reported: a) proximate composition; (b) apparent milk-protein (casein?) content according to the AOAC method; and (c) fatty acid composition of hazelnut oil. KMD

TUBERS AND VEGETABLES

- 3271 ATHERTON (D). Innovations in vegetable preservation. *IFST Proc.* 15 (3 Pt.1); 1982; 98-100
The author thinks that the vegetable preservation has reached a critical stage and what is wanted now is image and quality in the product and cost is also another aspect which could not be neglected. KAR
- 3272 HANSEN (H). Comparison of chemical composition and taste of biodynamically and conventionally grown vegetables. *Qualitas Plantarum.* 30(3/4); 1981; 203-211
It is often said that biodynamically grown vegetables differ from conventionally grown vegetables in their chemical contents. The experiments, comparing potatoes, carrots, beetroots and curly kale vegetables grown by the two different methods of cultivation on adjacent fields in different regions did not provide any clear proof of such a statement. No clear connection was found between the chemical composition of the vegetables and the two different ways of cultivation. VR
- 3273 HERRANZ (J), VIDAL-VALVERDE (C) and ROJAS-HIDALGO (E). Cellulose, hemicellulose and lignin content of raw and cooked Spanish vegetables. *J. Food Sci.* 46(6); 1981; 1927-3
- 3274 KAMEL (BS). Chemical composition of Arabian Gulf seaweeds. *Food Sci.+ Technol.* 14(3); 1981; 160-2
Sargassum Spp. and *Ulva lactuca* were found to be the most abundant seaweeds in the Gulf. Their protein content were 6.6 and 20.7% respectively. Amino acid profile showed that *Ulva lactuca* contains a fair amount of essential amino acids. The average caloric value was 345 Kcal/100 g. Seaweed is a poor source of lipids but the fatty acid composition indicated that seaweed contains C₁₄-C₂₂ fatty acid. Both species were found to be very rich in mineral content. The average iodine and Fe content were 78 and 57 mg/100 g. Heavy metals such as Pb, Hg and V were found in seaweed and averaged 0.24, 0.09 and 0.18 mg/100 g. AA
- 3275 ABO BAKER (TM), MOHAMED (MS) and MOUSTAFA (EK). Leaf protein isolates from some Egyptian crops. *Food Chem.* 9(4); 1982; 295-301
The solubility of nitrogen extracted from bean, cabbage, tomato and sugar cane leaves increased above pH 6 and below pH 3. The isoelectric point of the extracted proteins was in the pH range 3.5-4.5. The leaf protein isolates of the four species were prepared and the chemical composition was studied. Leaf protein was also incorporated in some ready-to-eat popular foods. KAR
- 3276 SHAH (FH), SHEIKH (AS), FARRUKH (N) and RASOOL (A). A comparison of leaf protein concentrate fortified dishes and milk as supplement for children with nutritionally inadequate diets. *Qualitas Plantarum.* 30(3/4); 1981; 245-58
40 children were fed Leaf protein concentrate (LPC) fortified dishes as a supplement and 40 other children were fed milk as a supplement; 20 children who were not given any supplements served as a control group. Data on increases in height and weight and on haemoglobin and red blood cell status confirmed that the LPC-fortified dishes were comparable to

milk as a supplement to provide protein, minerals and vitamins to nutritionally inadequate local diets. AA

ONION

- 3277 FERNANDEZ (M) and VEGA (FA). Innocuous alterations in preserved onions, *Allium cepa* L. *J. Food Sci.* 46(6); 1981; 1966-7

In the outer layers of pickled or canned onions there appears, at times, yellow colorations or deposits of yellow substances. The pigment has been identified as quercetin, a normal component of onion skins; this alteration is furthermore found to be totally innocuous. AA

BEET

- 3278 VON ELBE (JH), SCHWARTZ (SJ) and HILDENBRAND (BE). Loss and regeneration of betacyanin pigments during processing of red beets. *J. Food Sci.* 46(6); 1981; 1713-5

- 3279 ATTOE (EL) and VON ELBE (JH). Photochemical degradation of betanine and selected anthocyanins. *J. Food Sci.* 46(6); 1981; 1934-7

- 3280 BILYK (A) and HOWARD (M). Reversibility of thermal degradation of betacyanines under the influence of isoascorbic acid. *J. Agric. Food Chem.* 30(5); 1982; 906-8

Isoascorbic acid was effective in reversing the thermal degradation of betacyanines, the red pigments of beet. Heating an aqueous solution of red pigments cleaved the betacyanine molecule, causing the loss of red colour. When isoascorbic acid was added either before or after heating, the red colour of thermally degraded betacyanine in solution was restored almost completely after 24 hours of storage in the dark at 25 C. Isoascorbic acid did not produce a similar result with thermally degraded yellow betaxanthine pigments. AA

CARROT

- 3281 MAZZA (G). Dehydration of carrots. Effects of pre-drying treatment on moisture transport and product quality. *J. Food Technol.* 18(1); 1983; 113-23

The effect of blanching, sulphiting, starching, freezing and sucrose and sodium chloride dipping before air drying on moisture transport during carrot cube dehydration was studied. The results, interpreted in terms of existing theories combined with physical considerations, provide evidence that factors such as blanching, freezing and sucrose dipping affect moisture transport and product quality. AA

POTATO

- 3282 MONDY (NI) and CHANDRA (S). Effect of zinc fertilization on yield, enzymatic discolouration, phenolic and nitrogenous constituents of potato tubers. *J. Food Sci.* 46(6); 1981; 1878-80

- 3283 CHANDRA (S) and MONDY (NI). Effect of foliar application of auxin on the quality of potatoes. *J. Food Sci.* 46(6); 1981; 1870-73
- 3284 ISLAM (MN) and FLINK (JM). Dehydration of potato. I. Air and solar drying at low air velocities. *J. Food Technol.* 17(3); 1982; 373-85
Drying behaviour of potato in a natural convection solar dryer was investigated. In drying experiments conducted at low air velocity, as found in the solar dryer, it was shown that air flow conditions are of critical importance for drying behaviour. As a result of the presence of extensive, external mass transport resistances in deep bed drying, the air flow behaviour of the bed was more important than the drying behaviour of the single pieces. Thus, for deep bed solar drying, 10 x 10 mm french cut potatoes dried faster than 5 mm slices. (This result was opposite to that found for drying in thin layers). Drying time was noted to increase less rapidly than bed depth increased, so overall dryer productivity increased with increasing bed depth, within the constraint that drying be completable in 1 day. AA
- 3285 ISLAM (MN) and FLINK (JN). Dehydration of potato. II. Osmotic concentration and its effect on air drying behaviour. *J. Food Technol.* 17(3); 1982; 387-403
It is shown that osmotic concentration in a 45% sucrose/15% salt solution, prior to solar drying, results in a two- to five-fold increase in product throughput, due to moisture loss and solids uptake in the osmosis step and higher, allowable, final moisture contents for the finished product. Product organoleptic quality was judged to be good and ascorbic acid retention was similar to that reported for commercial dehydration processes. AA
- 3286 KLEIN (LB) and MONDY (NI). Comparison of microwaves and conventional baking of potatoes in relation to nitrogenous constituents and mineral composition. *J. Food Sci.* 46(6); 1981; 1874-7, 1880
- 3287 DAHLENBURG (AP). Prediction of darkening in potatoes during frying. *Food Technol. Aust.* 34(11); 1982; 544, 546-7
The excessive browning of potato chips (french fries) or crisps during deep frying makes these products unmarketable. The degree of darkening depends on the concentration of reducing sugars in the tubers. Reducing sugar concentration can be used as a predictor of browning susceptibility but a simple reliable test is not available. Three possible quick tests were compared with the behaviour of chips cooked by commercial methods. The colour developed on a fried piece of potato juice-impregnated chromatograph paper agreed well with that developed during frying of the chips. AA
- 3288 RIDLEY (SC), LINDSAY (RC) and HARGETT (SM). Effect of sample preparation on the apparent mealiness of fresh cooked potatoes. *Food Sci. + Technol.* 14(3); 1981; 131-3
Samples of rice baked potatoes were significantly more mealy and less moist when prepared by a single pass hand-held food ricer than with a swept-surface, power-driven device. Small potatoes (ca 150 g) yielded significantly more mealy and less moist samples than did large potatoes (ca 200-250 g) when each was baked at 218 C either for 80 minutes or to an internal temperature of 94 C. Rice samples from boiled potato pieces gave mealiness and moistness scores similar to corresponding rice samples from large baked potatoes. AA

- 3289 PURI (A), SOLOMOS (T) and KRAMER (A). Polygalacturonase in potato tubers - Its presence and some of its properties. *Food Sci. + Technol.* 14(3); 1981; 118-21
- Polygalacturonase (EC 3.2, 1.15) was extracted from potato tuber tissue *Solanum tuberosum* (variety Russet Burbank) and partially purified (8.2 fold) by ammonium sulphate precipitation and chromatography on a Sephadex G-100 column. The enzyme preparation thus obtained appears to be an exo-polygalacturonase with a molecular weight of 36,000 and a pH optimum of 5.5. The enzyme has an apparent K_m of 0.16% for polygalacturonic acid and a maximum hydrolysis of 15% was observed at a substrate concentration of 0.42%. The enzyme is stimulated by NaCl and by low concentrations of divalent cations such as Ca^{2+} and Sr^{2+} AA
- 3290 NARANG (RS). How they store potatoes in Afghanistan. *Indian Farm.* 31(2); 1981; 23-5
- Storage of potatoes in pits is described along with suggestions for their improvement, based on the work done earlier. KAR
- 3291 PUTZ (B) and KEMPF (W). Production and quality evaluation of pommes frites (potato chips). *Gordian.* 81(9); 1981; 196-201 (German)
- The definition and quality criteria of 'pommes frites' (i.e. French-fried potatoes), requirements of the raw material potato for the production of pommes frites, the technology of prefrying and nutritive value of pommes frites have been discussed in detail. VR
- 3292 AUGUSTIN (J), MAROUSEK (GI), ARTZ (WE) and SWANSON (BG). Retention of some water-soluble vitamins during home preparation of commercially frozen potato products. *J. Food Sci.* 46(6); 1981; 1697-700
- Retention values of commercially frozen potato products were lowest with ascorbic acid and folic acid, Depending on the potato product and the method of home preparation, these values ranged from 53-91%, and from 14-75% for ascorbic acid and folic acid, respectively. Thiamin retention values varied between total retention in pan-fried hashbrowns to 59% in pan-fried shoestring French fries. Niacin values were not affected by home preparation whereas in the case of vitamin B₆ values ranged from total retention to 79% retention. AA

SWEET POTATO

- 3293 MASON (RL). Sweet potato canning investigations. *Food Technol. Aust.* 34(12); 1982; 574-6
- Acceptable canned sweet potatoes can be produced by peeling the roots in boiling caustic soda (120 g/L) for 2 minutes, washing, cutting the tissue into 12 mm slices and packing the slices into lacquered cans with a sugar syrup of 15 Brix containing salt (15 g/L). The addition of sodium citrate (7.5 g/L) improved the appearance of sweet potatoes packed in lacquered cans; the addition of calcium chloride (5 g/L) improved both texture and appearance of the product. AA

DIOSCOREA

- 3294 OSAGIE (AU) and OPUTE (FI). Composition of lipids in Dioscorea tubers. *J. Agric. Food Chem.* 30(5); 1982; 993-6

- 3295 BRILLOUET (JM), TRECHE (S) and SEALY (L). Alterations in cell wall constituents of yams *Dioscorea dumetorum* and *D. rotundata* with maturation and storage conditions. Relation with post-harvest hardening of *D. dumetorum* yam tubers. *J. Food Sci.* 46(6); 1981; 1964-5, 1967

ALFALFA

- 3296 HOOD (LL), CHENG (SG), KOCH (U) and BRUNNER (JR). Alfalfa proteins: Isolation and partial characterisation of the major component - Fraction 1 protein. *J. Food Sci.* 46(6); 1981; 1843-9
- Fraction I protein was extracted from fresh alfalfa (*Medicago sativa*) leaves and purified by ammonium sulphate fractionation, DEAE-cellulose and Sephadex G-200 chromatography. The isolate possessed a specific activity for ribulosebisphosphate carboxylase EC 4.1.1.39) of 1.01 units/mg protein. An approximate molecular weight of 573,000 was determined from values of $S_{20,w}^0$ (18.7) and $D_{20,w}^0$ (2.97). The protein contained 26 disulphide and 37 sulphhydryl groups - only one of which was titratable in the undenatured protein complex. It migrated as a single band by Tiselius electrophoresis and as a dense zone in polyacrylamide gels (disc). In the presence of SDS, two principal subunits of ~52,000 and ~12,500 daltons were revealed. Based on the FAO/WHO (1973) provisional pattern for essential amino acids, the protein was slightly deficient in sulphur-containing residues. AA
- 3297 LYON (CK) and KOHLER (GO). Stabilization of carotene and xanthophyll in alfalfa leaf protein concentrate. *J. Agric. Food Chem.* 30(5); 1982; 934-7

SPINACH

- 3298 SCHOBBER (B). Are phytoalexins resistance active substances (biostatica) or metabolites of the pathogenesis? *Qualitas Plantarum.* 30(3/4); 1981; 283-7 (German)
- The inoculation of resistant and susceptible spinach plants with *Peronospora farinosa* f.sp. *spinaciae* revealed histological differences between compatible and incompatible interactions. Similar investigations with tomatoes after inoculation with *Cladosporium fulvum* were in line with these results and indicated the occurrence of fungitoxic substances - the phytoalexins. The phytoalexin theory had been confirmed for leaves only, but not for stems and fruits of tomatoes as well as potato tubers, i.e. in harvested products. The phytoalexins are only metabolites of the pathogenesis in these products. AA
- 3299 ROSENBLOOM (NJ) and POTTER (NN). Effects of processing on zinc levels in spinach, beef, and potatoes. *J. Food Sci.* 46(6); 1981; 1707-9
- Spinach, beef, and potatoes were subjected to combinations of cooking, freezing, retorting, and storage and analyzed for total zinc and water soluble zinc, before and after acid - enzyme digestion. Zinc and its complexes that were soluble were membrane filtered to exclude the passage of substances larger than 5,000 daltons. Approximately 30-50% of the total zinc in spinach systems and about 70-100% of the zinc in potato systems was water soluble. Practically none of the endogenous zinc in beef was water soluble. Regardless of processing method,

essentially all zinc in spinach and potatoes and about half of the zinc in beef was released after acid-enzyme digestion. All of the spinach and potato zinc and at least a third of the beef zinc following digestion passed through the 5,000 dalton membrane. AA

CABBAGE

- 3300 BOYD (JN) and STOEWSAND (GS). Blood α -fetoprotein changes in rats fed aflatoxin B₁ and various levels of cabbage. *J. Food Sci.* 46(6); 1981; 1923-6

CELERY

- 3301 BRAUN (HE) and STANEK (J). Application of the AOAC multi-residue method to determination of synthetic pyrethroid residues in celery and animal products. *J. Assoc. Off. Anal. Chem.* 65(3); 1982; 685-9

Permethrin, cypermethrin, and fenvalerate are extracted from celery, egg yolk, beef muscle, and milk with acetonitrile, partitioned into hexane, and cleaned up on Florisil for quantitation by electron capture gas chromatography. Recoveries of the 3 pyrethroids averaged 94-103% from celery and 82-97% from animal products. Minimum detectable levels of <5 ng/g are readily attainable. The method also allows for the simultaneous extraction and cleanup of the organochlorine hydrocarbon insecticides which have been routinely analyzed in the past. AA

CAULIFLOWER

- 3302 BARNARD (RJ), DURAN (AP), SWARTZENTRUBER (A), SCHWAB (AH), WENTZ (BA) and READ (RB) Jr. Microbiological quality of frozen cauliflower, corn, and peas obtained at retail markets. *Appl. Environ. Microbiol.* 44(1); 1982; 54-8

The microbiological quality of blanched frozen cauliflower, cut corn, and peas at the retail level was determined. At 35 C, mean aerobic plate count (APC) values for cauliflower, corn, and peas, respectively, were 30,000, 6,100, and 4,700 per g; at 30 C, the mean APC values were 45,000, 8,500, and 6,800 per g, respectively. Geometric means for coliform, *Escherichia coli*, and *Staphylococcus aureus* counts for all three vegetables were <10 per g. AA

TOMATO

- 3303 GOODENOUGH (PW). Comparative biochemistry of tomato fruits during ripening on the plant or retarded ripening. *Food Chem.* 9(4); 1982; 253-67

Tomato fruit kept in an atmosphere of 5% carbon dioxide, 5% oxygen and 90% nitrogen showed an increase in glucose, fructose and citric acid with a decrease in starch and malic acid after 4 weeks. However, there was no synthesis of lycopene after this time, nor change in multiple form pattern of some of the respiratory enzymes. KAR

- 3304 ABDEL-RAHMAN (A-HY). Nutritional value of some canned tomato juice and concentrates. *Food Chem.* 9(4); 1982; 303-6

Fresh tomatoes, juice and concentrate were analysed chemically. The canned tomato products were not a good source of vitamin C, but their niacin content was higher than that of the fresh tomatoes. Thiamin was not affected by the canning process, but riboflavin was, and vitamin A was slightly affected. Nine elements: Ca, Cu, Fe, Mg, Mn, Ni, K, Na and Zn, were determined in the fresh tomato and its products, but pb was found only in the final products. AA

- 3305 ABDEL-RAHMAN (A-HY). The chemical constituents of tomato seeds. *Food Chem.* 9(4); 1982; 315-18

Proximate, mineral and amino acid composition of tomato seeds along with the fatty acid constituents of the seed oil are given. KAR

EGG PLANT

- 3306 MOHARRAM (YG) and OSMAN (HOA). Some changes in cottonseed oil during frying of flafel and eggplant. *Food Chem.* 9(3); 1982; 159-65

The changes in the characteristics, composition and technological properties of cottonseed oil during heating for 50 hours at 200 C in the presence of air were studied. The effects of the heated oil in frying two types of Egyptian vegetable - flafel and eggplant - were also examined. The results showed that as the heating time of the oil increased: (a) the free fatty acids increased and both iodine value and peroxide number decreased; (b) the triglycerides hydrolysed and (c) the loss of oil weight, the tendency of oil to foam and the time necessary to fry the vegetable increased. AA

PUMPKIN

- 3307 DALL'AGLIO (G), CARPI (G) and VERSITANO (A). The industrial transformation of squash. *Ind. Conserv.* 56(4); 1981; 244-9 (Italian)

The possibilities of processing squashes (pumpkins) into purees, powders (drum-dried and spray-dried) and dice have been investigated. The main processing steps have been described, and some approximate yield values as well as the analytical and organoleptic characteristics of the final products have been reported. A flow diagram of the manufacturing line has been given. The powders - especially sugared powders - can be used for instant reconstitution into spreads and sauces. Dehydrated cubes can be used in soups. Pasteurized, acidified puree has an astringent taste; it may prove useful in ices where the characteristics of the starting material are maintained better. KMD

RIDGE GOURD

- 3308 KAMEL (BS) and BLACKMAN (B). Nutritional and oil characteristics of the seeds of angled luffa *Luffa acutangula*. *Food Chem.* 9(4); 1982; 277-82

The yield of seeds from ridged gourd fruits was 33.5% while the kernel was found to possess 50+ of the seed weight. The protein and fat contents of the kernel were 39 and 44% respectively. The glycerides of oleic acid and linoleic acid constitute 68% of the total kernel oil.

Iodine value, saponification value and acid value were 99.5, 190.8 and 10.5 respectively. The maximum melting and freezing points were -3 and -10 C respectively. The seeds were also found to be a good source of certain amino acids, phosphorus, iron and magnesium. KAR

FRUITS

- 3309 BARBER (S). Some recent contributions of research in Valencia on indigenous products relating to Food Science and Technology. *Rev. Agroquim. Tecnol. Aliment.* 21(2); 1981; 175-84 (Spanish)
- 3310 SIDDAPPA (GS). Status of fruit and vegetable preservation industry in India and future prospects. *Indian Food Ind.* 1(3); 1982; 73-80
Discusses: genesis; establishment of R & D centres; hurdles for quick growth of the industry; developments in the recent years; raw materials - fruits and vegetables; tin and glass containers; product development, dried and dehydrated fruit and vegetable products; colours and flavours; storage and transport of fruits and vegetables; frozen fruits and vegetables; preserves, candied and crystallised products; Indian pickles and condiments; steeping preservation of fruits and vegetables; constraints for rapid development and remedial measures. BSN
- 3311 WATADA (AE). A high-performance liquid chromatography method for determining ascorbic acid content of fresh fruits and vegetables. *Hort-science.* 17(3); 1982; 334-5
Ascorbic acid of fresh fruits and vegetables was extracted with 6% metaphosphoric acid and determined effectively using a C₁₈ cartridge in a radial compression module and 1.5% NH₄H₂PO₄ mobile phase in a high performance liquid chromatography AA
- 3312 GIERSCHNER (K). Pectin and pectic enzymes in fruit and vegetable technology. *Gordian.* 81; 1981; 171-5, 205-9
Models have been used to explain how pectin is formed and inserted in plant tissue, and how pectin is influenced by technological methods, especially heat treatment. The mechanisms of gel formation by commercial pectin and the factors that influence gel formation - viz. chain length, degree of esterification, side chains, and the observed irregularities in the chain - have been discussed. The classification of pectic enzymes and mode of action as well as their processing, purification, and the determination of their effect have been detailed. Finally, the author deals with the following technological aspects: effects of native pectic enzymes on cloud stability and clarification of juices; strain-hardening of plant tissue by gentle heating; and applications of pectic enzymes in fruit and vegetable processing, e.g. in the disintegration of fruit pulp, or the maceration of plant tissue. KMD
- 3313 VIDAL-VALVERDE (C), BLANCO (I) and ROJAS-HIDALGO (E). Pectic substances in fresh, dried, desiccated and oleaginous Spanish fruits. *J. Agric. Food Chem.* 30(5); 1982; 832-5

- 3314 RRAY (F). Use of tropical fruits in ice-cream production. *Ind. Aliment.* 20(181); 1981; 171-3 (Italian)

The ingredients used in ice-cream made from milk cream, and in various fruit-based ice confections ("sorbetto", "gliacciolo"), have been compared. The author points out that tropical fruits such as the papaya, mango, passion fruit, guava, and orange can also be used to make the latter type of ices. KMD

STRAWBERRY

- 3315 LLEWELLYN (GC), EADIE (T) and DASHEK (WV). Susceptability of strawberries, blackberries, and cherries to *Aspergillus* mold growth and aflatoxin production. *J. Assoc. Off. Anal. Chem.* 65(3); 1982; 659-64

Three aflatoxigenic isolates of *Aspergillus*, *A. flavus* ATCC 15548 and NRRL 3251 as well as *A. parasiticus* NRRL 2999, were cultured on homogenates of blackberries, cherries, and strawberries for 14 days at 28 ± 2 C. Although all fruits served as substrates for both *Aspergillus* growth and aflatoxin production, cherries appeared to be a more favourable substrate than did blackberries, and the latter was more favourable than strawberries. Whereas *A. flavus* produced both B₁ and G₁ on all substrates, it yielded B₂ and G₂ only on cherries. Although *A. parasiticus* NRRL 2999 synthesized B₁, B₂, G₁, and G₂ on both blackberries and cherries, no aflatoxins were detected on strawberries. In contrast, *A. flavus* NRRL 3251 failed to produce detectable levels of aflatoxin on any substrate. All substrates supported both mycelial growth and subsequent sporulation with cherries > blackberries > strawberries. AA

RASPBERRY

- 3316 FOGY (I), GRUNDMANN (H), SCHMID (ER) and HUBER (JFK). High pressure liquid chromatographical determination of raspberry ketone in natural and artificially aromatized raspberry products. *Dtsch. Lebensmittel Rundschau.* 77(8); 1981; 271-5 (German)

The impact-character-compound, 1-(4'-hydroxyphenyl)-3-butanone (raspberry - ketone), which represents the typical aroma of raspberries, is easily obtainable by chemical synthesis and is used therefore, for the flavour improvement of raspberry based food products. Genuine raspberry samples contain less than 2 µg/g raspberry-lectone, whereas, in artificially flavoured products upto 3.5 mg/g were detected. The method applied in this investigation, high pressure liquid chromatography, has the great advantage, that the necessary lower detection limit can be reached with small sample sizes and that the sample pretreatment can be very simple. Applying a one column chromatographic separation, about 30 minutes are necessary for a single determination of the amount of raspberry ketone (including sample pretreatment). If the selective detection of smaller amounts of raspberry ketone by UV absorption is impaired by other matrix components, they can be removed by two-column chromatography.

GRAPE

- 3317 MARCY (JE), CARROLL (DE) and CUMMINGS (GA). Changes in concentration of certain elements during maturation of muscadine grapes (*Vitis rotundifolia*). *J. Food Sci.* 46(6); 1981; 1891-3, 1897
- Changes in percent ash and certain elements were followed during maturation of berries of two cultivars of muscadine grapes (*Vitis rotundifolia*). Analyses were done on deseeded berries. Percent ash increased significantly during maturation of Carlos berries, but did not increase significantly during maturation of Noble berries. Potassium was the element in highest concentration in both cultivars during maturation and at harvest. Potassium, calcium, phosphorus, and sodium were the major elements found to be significantly correlated with maturation and were found in concentrations similar to those reported in the literature for *V. finifera* grapes; Iron, copper, zinc, and manganese were minor components. Four additional muscadine cultivars, sampled only at full maturity, had similar concentrations of elements to those found in ripe berries of Carlos and Noble. The averaged values of ash (%) and elements (ppm) for all six cultivars when sampled at their normal harvest dates are: ash = 0.57; Na = 58.6 (Carlos and Noble only); P = 99.6; K = 1641.0; Ca = 124.2; Mg = 59.2; Mn = 7.2; Cu = 0.5; Zn = 0.5; Fe = 3.0. AA
- 3318 FLANZY (C), BURET (M) and CHAMBROY (Y). Shikimic acid during anaerobic metabolism of grape berry. *Sci. Aliment.* 1(2); 1981; 283-292 (French)
- ¹⁴C-labelled, d,l/shikimic acid was injected into berries of Carignan grapes, which were then stored in a CO₂ atmosphere at 35 C. After 3 days in anaerobiosis, the recovered radioactivity was found mainly in phenylalanine and tyrosine. Fairly high radio-activities were measured in the fumarate, succinate, and malate fractions; some radio-activity was also measured in the ketonic acids, phenolic acids and phenols, and ethanol fractions. Thus, during the anaerobic metabolism of grapes, shikimic acid is converted into compounds having an aromatic nucleus, and their derived products. Such substances could participate in the development of the aroma in wines made by the carbonic maceration process. The hypothesis of a compartment where oxidative de-amination of amino-acids can take place has been postulated. KMD

BANANA

- 3319 KAYISU (K), HOOD (LF) and VANSOEST (PJ). Characterization of starch and fiber of banana fruit. *J. Food Sci.* 46(6); 1981; 1885-90
- 3320 KAYISU (K) and HOOD (LF). Molecular structure of banana starch. *J. Food Sci.* 46(6); 1981; 1894-7
- Starch isolated from green banana fruit was hydrolyzed with pullulanase and β -amylase and the hydrolyzates fractionated on Sephadex G-50 and G-100. Debranching of the starch and its β -limit dextrin with pullulanase revealed that banana amylopectin had populations of d.p. 45 and d.p. 15 chains in a molar ratio of 1:6. The average chain length of the debranched starch and the debranched β -limit dextrin was 26 and 10, respectively. The amylose content was 16%. Amylase prepared by selective leaching and by thymol complexation had β -amylolysis limits $\geq$ 92%. AA

CITRUS

- 3321 LAWRENCE (BM). Progress in essential oils. Coumarins and psoralens in citrus oils. *Perfum. Flavor.* 7(3); 1982; 57-8, 60-64
Discusses the presence, composition and role of coumarins and psoralens in Bergamot oil, bitter orange oil, grape fruit oil, lemon oil, lime oil, orange oil, Persian lime oil, petitgrain oil and tangerine oil. BSN
- 3322 LEXOW (D), DONGOWSKI (G) and BERTH (G). Osmometric determination of molar mass of low-esterified pectins in aqueous solution. *Nahrung.* 25(3); 1981; K19-K21 (German)
- 3323 MAHONEY (RR), FARRELL (C) and WETHERBY (AM). Interaction of lysine with pectin. *Food Chem.* 9(4); 1982; 289-94
The interaction of L-lysine with citrus pectin was studied in a model system to determine under what conditions it would occur and whether it would be of physiological significance. Thirty-nine per cent of the lysine was non-diffusible at pH 7, when the pectin concentration was 0.5% and the lysine concentration was $2 \times 10^{-3}M$. Of this, 29% was restricted due to the Donnan effect and the remainder was specifically bound. Increasing the pH (in the range 6-8) and the pectin concentration both increased the non-diffusible lysine. Increasing the ionic strength and the degree of esterification both decreased the non-diffusible lysine. It was concluded that lysine would not bind to pectin in the intestine because of the high salt concentration there. AA

LEMON

- 3324 STAROSCIK (JA) and WILSON (AA). Seasonal and regional variation in the quantitative composition of cold-pressed lemon oil from California and Arizona. *J. Agric. Food Chem.* 30(5); 1982; 835-7
Cold-pressed peel oils from California and Arizona lemons were analyzed by glass capillary gas chromatography. Thirty-eight components were determined in early-, mid-, and late-season desert and coastal fruit by using the internal standard method. Several of these, including α -pinene, limonene, neral, geranial, nonanal, linalool, and geranyl acetate, showed large variations in concentration as a function of either maturity or geographic origin of the fruit. Climatic differences between the two growing regions are presumed to be most responsible for the compositional differences observed. AA

ORANGE

- 3325 SYVERTSEN (JP). Dehydration of freeze-damaged oranges. *Hortscience.* 17(5); 1982; 803-4
- 3326 WILD (R), DOBROVOLNY (H), DESTERHELT (G), SCHIEDT (K) and VECCHI (M). Detection of xanthophyll di-esters in orange oils adulterated with tagetes extracts. *Dtsch. Lebensmittel Rundsch.* 77(7); 1981; 245-8 (German)
In West Germany, the addition of Tagetes extracts to orange products has to be declared on the label. Such an admixture can be detected by the

chromatographic method developed by Wild and Dobrovolny. This paper fully confirms these earlier results. Furthermore, the authors have succeeded in characterizing the 6th peak of the HPLC analysis of Tagetes extract and of tagetes adulterated orange oil (5th peak in this paper) as all-trans-lutein-palmitate-stearate, with the help of an absorption spectrum and GC/MS analysis following ester interchange. The absence of this compound in natural orange oils has been proved. KMD

DATE

- 3327 MAROUF (BA) and ZEKI (L). Invertase from date fruits. *J. Agric. Food Chem.* 30(5); 1982; 990-93

MANDARIN

- 3328 GUARDIOLA (JL), AGUSTI (M), BARBERA (J) and BANZ (A). Gibberellic acid, fruit ripening and senescence in the "Clementina" mandarin. (*Citrus reticulata* Blanco). *Rev. Agroquim. Tecnol. Aliment.* 21(2); 1981; 225-39 (Spanish)

APRICOT

- 3329 SOUTY (M), BREUILS (L) and ANDRE (P). Firming apricots halves with calcium salts. *Sci. Aliment.* 1(2); 1981; 265-82 (French)

In France, canning apricots, especially c.v. Rouge du Roussillon, results in product of poor texture because of the pectic degradation. Such a degradation was analysed and experiments, using calcium salts, were monitored to increase firmness of these products. Pectic substances from apricot have an important high methoxyl fraction, no pectic acid and a poor pectinesterase (PE : EC 3.1.1.11) activity. In such conditions pecto-calcic firming gels are not available. However, processing apricots halves with calcium chloride improves the canned products. AA

- 3330 CHAIROTE (G), RODRIGUEZ (F) and CROUZET (J). Characterization of additional volatile flavour components of apricot. *J. Food Sci.* 46(6); 1981; 1898-901, 1906

The volatile components of apricot variety "Rouge du Roussillon" were isolated by vacuum distillation and fractionated on silica gel. Analysis by combined gas chromatography-mass spectrometry led to identification of several compounds identified for the first time from this product. These compounds included p-hydroxybenzaldehyde, p-methoxybenzaldehyde, (3-phenyl propyl)-propyl or isopropyl ketone, 3-nonene-2-one, damascenone, β -ionone, dihydroactinidiolide, 2-phenylethanol, cis rose oxide and nerol oxide. The formation mechanism of these compounds is envisaged. Fractions isolated by chromatography on silica gel and head space concentration on Chromosorb 105 were sniffed and analyzed by gas chromatography. The results obtained indicate that aroma of apricot is due to the presence of compounds such as benzaldehyde, linalool, 4-terpinenol, α -terpineol and perhaps 2-phenylethanol which are responsible for the floral and fruity part of the aroma. Lactones previously identified are "background" compounds as in Cling peach. AA

CHERRY

- 3331 BAZZARINI (R), BIGLIARDI (D), GHERARDI (S) and TRIFIRO (S). Principal analytical characteristics of Italian sweet and sour cherries. *Ind. Conserv.* 56(4); 1981; 259-62 (Italian)

No significant differences in composition were found between Italian sour cherries and sour cherries from other countries. The sorbitol and *l*-malic acid contents, as well as the ratios of *l*-malic/d, *l*-malic acid, glucose/fructose, and asparagin/total aminoacids were identified as the most significant and useful parameters for evaluating the quality and genuineness of cherry purees and juices. Sweet cherries differ from sour cherries almost solely in their acid content. KMD

PEACH

- 3332 ANDERSON (RE). Long-term storage of peaches and nectarines intermittently warmed during controlled-atmosphere storage. *J. Am. Soc. Hortic. Sci.* 107(2); 1982; 214-6

Peaches and nectarines (*Prunus persica* (L.) Batsch) ripened at 18 to 20 C after storage in air for 9 weeks at 0 c developed severe internal breakdown and were of very poor quality. Comparable fruit intermittently warmed (1W) for 2 days in air at 18 to 20 during storage at 0 in CA (1% O₂ + 5% CO₂) and then ripened generally had little breakdown and retained good quality for about 20 weeks. Less mature fruits (6.8 kg at harvest) were more acid after storage than were more mature fruit (5.5 kg at harvest). Fruit dipped in benomyl at each 1W treatment had no less decay than those dipped only before storage but they had a better internal appearance and were more acid. Fruit stored in CA after 2 weeks delay in 0 C air generally were poorer in quality than those stored in CA within 2 or 3 days of harvest. AA

APPLE

- 3333 Le FLUFY (MJ). Harvest trials with a prototype apple harvester. *J. Agric. Eng. Res.* 27(5); 1982; 415-20

The orchard system used with a prototype apple harvester using a combing principle is described. The method of assessing the harvesting ability of the machine and the harvesting results are discussed. Fruit damage levels were low but not all fruits were successfully collected on to the harvester. AA

- 3334 FORBITO (P), URBICAIN (MJ) and ROTSTEIN (E). Water vapour - air effective diffusivity in apple tissues. *J. Food Sci.* 46(6); 1981; 1960-61

- 3335 WATKINS (CB), HARMAN (JE), FERGUSON (IB) and REID (MS). The action of lecithin and calcium dips in the control of bitter pit in apple fruit. *J. Am. Soc. Hortic. Sci.* 107(2); 1982; 262-5

Addition of 1% lecithin (phosphatidyl choline) to 4% Ca dips increased internal CO₂ levels and decreased O₂ levels in fruit of apple stored at 3 C. The climacteric rise was also delayed by lecithin. The beneficial effect of lecithin plus Ca in bitter pit control probably result from rapid modification of gas exchange together with increased Ca uptake. KAR

- 3336 LITTLE (CR), FARAGHER (JD) and TAYLOR (HJ). Effects of initial oxygen stress treatments in low oxygen modified atmosphere storage of 'Granny Smith' apples. *J. Am. Soc. Hortic. Sci.* 107(2); 1982; 320-23

PEAR

- 3337 ASKAR (A) and EL-SAMAHY (SK). Chemical composition of prickly pear fruits. *Dtsch. Lebensmittel-Rundschau*. 77(8); 1981; 279-81 (German)
- Chemical composition of prickly pear fruits was found to be as follows: moisture 85.1%, total soluble solids 13.2%, reducing sugars 6.6%, crude protein 0.8%, crude fiber 0.1%, fat 0.7%, ash 0.4% and ascorbic acid 25.0 mg/100 g. Glucose was the dominant sugar. The amounts of the organic acids determined as mg/100 g were citric 61.0, malic 23.3, quinic 19.1, shikimic 2.8. Prickly pear fruits are rich in magnesium and calcium, and have normal concentration of sodium, potassium and phosphate. Characteristic for prickly pear fruits is the high content of the free amino acids, serine, γ -amino butyric acid, glutamine, proline, arginine, and histidine, and the presence of methionine as a free amino acid. AA

GOLD FRUIT

- 3338 WILSON (RD). New Zealand gold fruit skin - waste product or potential goldmine. *Food Technol. NZ*. 17(10); 1982; 71,75

SUGAR, STARCH AND CONFECTIONERY

- 3339 ROBIN (J-P) and TOLLIER (M-T). Automatic assay of reducing sugars using tetrazolium blue - Applications in gel-permeation chromatography. *Sci. Aliment.* 1(2); 1981; 233-46 (French)
- The automatized system for the assay of reducing sugars with tetrazolium blue is versatile, accurate ($\pm 1.9\%$), and very sensitive (3 nM); ten samples can be analyzed in one hour, with a complete separation of the concentration peaks. Total reducing sugars, and easily oxidizable organic compounds, can be determined in aqueous, or hydro-alcoholic, vegetal extracts which have been adequately purified. The Beer-Lambert law holds good for glucose levels up to 500 $\mu\text{g/ml}$. KMD
- 3340 VIDALES (CMB), PLETTI (EA) and LONCIN (M). Observations on aroma retention during air drying of sugar-solutions. *Food Sci. + Technol.* 14(3); 1981; 153-9 (German)
- 3341 HEROLD (R) and FOUASSIER (JP). Photochemical grafting of vinyl monomers on to starch. *Starch*. 33(3); 1981; 90-7
- 3342 MORMANN (JE) and MUHLEMANN (HR). Influence of α -amylase and α -glucosidase inhibitors on oral starch metabolism. *Food Sci. + Technol.* 14(3); 1981; 166-9
- The effect of two bacterial glucosidase inhibitors on starch degradation by human salivary α -amylase was investigated *in vivo*. Analysis of starch digestion included measurement of reducing end groups and gel

filtration chromatography of starch hydrolyzates. Rinsing with both α -amylase and α -glucosidase inhibitors, added to starch, reduced its degradation. The telemetrically measured pH of inter dental microbial plaque rapidly decreased in response to starch hydrolysis, with addition of glucosidase inhibitors to starch the pH drop was inhibited. AA

- 3343 RIQUET (A-M) and TOLLIER (M-T). Determination of cell-wall polysaccharides and lignin by different methods. I. Comparative study. *Food Sci. + Technol.* 14(3); 1981; 109-22 (French)
- 3344 RIQUET (A-M) and TOLLIER (M-T). Determination of cell-wall polysaccharides and lignin by different methods. II. Signification and limits. *Food Sci. + Technol.* 14(3); 1981; 113-7 (French)
- 3345 HARTMEIER (W). New findings in the oxidation of glucose by means of immobilized glucose oxidase. *Starch.* 33(3); 1981; 97-102

CONFECTIONERY

- 3346 RIEDEL (HR). Automatic decorating and strewing of coated sweets. *Confect. Prod.* 47(11); 1981; 492, 494-5
- 3347 FOX (H). Confectionery packaging in the USA. Generic packages. *Confect. Prod.* 47(11); 1981; 501
- 3348 DAY (FT). Papers for wraps, bands, overwraps and multi-packs. Sleeves for slabs and bars. *Confect. Prod.* 47(11); 1981; 511, 513
- 3349 STRATIL (HH) and REICHMUTH (Ch). Combatting infestation by the dry-fruit moth (*Plodia interpunctella* Hbn) in confectionery, by refrigerated storage. *Gordian.* 81(11); 1981; 258-62 (German)

Eggs of the dry-fruit moth can be killed by exposure to temperatures between +1 and +14 C. Ova at all stages were killed with 16 days at 10 ± 2 C, while at temperatures below 8 C, 30 days were required to kill the ova. On simulating practical temperature variations during the fastest, average, and slowest rates of cooling of some common, commercial, sweet confections, it was found that eggs, especially older eggs, could be incubated (for 3-5 days at +20 C), and could develop into larvae. Younger eggs, however, could be killed within 3 weeks at such temperatures. KMD

TOFFEE

- 3350 SCHRIEBER (P). Streusel (or toffees). *Gordian.* 81(11); 1981; 256-7 (German)

The recipes for three different types of toffees have been given: a) hard sugar toffees, (b) brown, soft, eating toffees with some cocoa components, and (c) chocolate toffees. KMD

CHEWY CANDY

- 3351 RICHARDSON (T). Chewy candies. *Manuf. Confect.* 61(12); 1981; 43-4

CHOCOLATE

- 3352 DIMICK (PS) and HOSKIN (JM). Chemico-physical aspects of chocolate processing. A review. *Can. Inst. Food Sci. Technol. J.* 14(4); 1981; 269-82

Discusses: botanical types and sources of cocoa beans; manufacture of chocolate; conching process; flavour changes during conching and textural changes during conching. BSN

- 3353 ZIEGLEDER (G) and ROBINSON (L). Evaluation of qualitative changes in pralines - Design and evaluation of a storage test. *Gordian* 81(5); 1981; 114-20 (German)

After discussing the effects of temperature, humidity, and packaging materials on stored pralines; the authors have described some of the sensory tests that can be used. A specific evaluation scheme for chocolate products has been presented. The scheme can be used to determine the "minimum storage life" of the product; that is to say, the minimum period for which the product retains its typical good qualities, without any sign of spoilage. KMD

BAKERY PRODUCTS

- 3354 WOOD (P). Innovations in food (bakery products). *IFST Proc.* 15(3 Pt.1); 1982; 101-11

The discussion covers bread and cakes only. The author talks about the composition of the market and its current trends, before making some suggestions as to how he thinks the marketing of baked products could be improved and in particular how technology might be used during the next decade to assist in product improvements. KAR

- 3355 SEILER (K) and ANTILA (J). Fundamental considerations on measurement of temperature with resistance thermometers, in baked products. *Gordian*. 81; 1981; 125-127, 149-152, 178-180 (German)

- 3356 MALLIKHARJUNA RAO (N). Extruded foods. *Indian Food Ind.* 1(4); 1982; 138-42

Discusses: extrusion cooking (process design extruder advantages; disadvantages), ingredients; extruder classification (pasta extruders, high pressure forming extruders, collect extruders, high-shear cooking extruders, autogenous extruders, isothermal extruders; polytropic extruder) and extruder applications. BSN

BREAD

- 3357 ANON. Symposium: "Evaluation of Baking Behaviour by Baking Tests". *Getreide Mehl Brot.* 35(4); 1981; 101-112

The texts of the following 7 papers have been presented. SEIBEL (W) - Possibilities and limitations of standard baking tests (p.100-102); GENZKEN (K) - Requirements regarding baking tests for milling purposes (p.102-104); WASSERMANN (L) - Requirements regarding baking tests from the stand point of manufacturers of baking improvers (p.104-105); HERENDI (NE) - A recording baking test with a Maturograph and an oven-rise recorder (p.105-107); MEPPPELINK (EK) - Applicability of a micro-baking test in wheat breeding (p.107-109); KIEFFER (R), GARNREITER (F), HOFMANN (HW), KIM (JJ) and BELITZ (HD) - Baking tests and rheological experiments on a small scale (p.110-112); GUNZEL (G) - Micro-baking test for the evaluation of wheat cultivars (p.112). KMD

- 3358 RABE (E) and SEIBEL (W). Nutritive value of breads and special breads. *Getreide Mehl Brot.* 35(5); 1981; 129-35 (German)

It would be desirable, if the nutritive value of many more foods (than those required by law) were declared voluntarily. The nutritive and calorific values of various types of bread have been measured over the preceding 3-year period. Some deviations from the values found in older tables have been noticed. They are due to changes in raw material as well as in technology. On the whole, bread has a low fat and a low sugar content, and is rich in carbohydrates and ballast (dietary fibre). KMD

- 3359 STELLER (W). Evaluation of bread by consumers and physicians. *Getreide Mehl Brot.* 35(5); 1981; 135-7 (German)

On evaluating the bread consumption data, and the opinions expressed by consumers and doctors, it appears that bread consumption will increase further. A per caput consumption of 73.3 kg/year of bread and small baked goods works out to a dietary fibre intake of 14.1 g/head/day. KMD

- 3360 HSU (DL), LEUNG (HK), MORAD (MM), FINNEY (PL) and LEUNG (CT). Effect of germination on electrophoretic, functional, and bread-making properties of yellow pea, lentil, and faba bean protein isolates. *Cereal Chem.* 59(5); 1982; 344-50

The physicochemical properties of protein isolates from ungerminated and germinated yellow peas, lentils, and faba beans were investigated. Polyacrylamide gel electrophoretic patterns revealed different degrees of protein modification among the three legumes after four days of germination. The effect of germination on nitrogen solubility; emulsifying capacity, foam capacity and stability, viscosity, gelation, and water sorption properties of the protein isolates from the three legumes also varied. Replacement of wheat flour with 5 or 8% legume protein isolates had deleterious effects on loaf volume and crumb grain of bread. Germination affected the baking properties of protein isolates from faba beans, but not those from peas or lentils. AA

- 3361 RANHOTRA (GS) and WINTERRINGER (GL). The use of magnesium powder in fortified bread. *Cereal Chem.* 59(5); 1982; 446-8

No adverse effect was observed in bread fortified with magnesium powder (85% mg; at the rate of 20-30 mg of mg/100 g of flour). Fortification, however, improved the general trend quality, and loaf volume, while pH remained within acceptable limits. BSN

- 3362 SALOVAARA (H). Sensory limitations to replacement of sodium and magnesium in bread. *Cereal Chem.* 59(5); 1982; 427-30

COOKIE

- 3363 GAINES (GS). Influence of dough absorption level and time on stickiness and consistency in sugar snap cookie doughs. *Cereal Chem.* 59(5); 1982; 404-7

CAKE

- 3364 HUNGER (H). Shelf-life of cakes with medium fat content. *Getreide Mehl Brot.* 35(5); 1981; 139-40 (German)
The warm emulsification method and the "all-in" method of making cakes have been explained with the help of three recipes. The types of emulsifiers required have been described. Cakes with a medium fat content can remain free from moulds for 4-5 weeks. KMD
- 3365 GAINES (GS) and DONELSON (JR). Contribution of chlorinated flour fractions to cake crumb stickiness. *Cereal Chem.* 59(5); 1982; 378-80
- 3366 LEE (CC), HOSENEY (RC) and VARRIANO-MARSTON (E). Development of a laboratory-scale single-stage cake mix. *Cereal Chem.* 59(5); 1982; 389-92
- 3367 LEE (CC) and HOSENEY (RC). Optimization of the fat-emulsifier system and the gum - egg white - water system for a laboratory-scale single-stage cake mix. *Cereal Chem.* 59(5); 1982; 392-3

PASTA

- 3368 RAYMAN (MK), WEISS (KF), RIEDEL (GW), CHARBONNEAU (S) and JARVIS (GA). Microbiological quality of pasta products sold in Canada. *J. Food Prot.* 44(10); 1981; 746-9
Four hundred and ninety-nine samples of Canadian manufactured pasta and 130 samples of imported pasta were analyzed by standard procedures for aerobic colony counts, *Staphylococcus aureus*, coliforms and *Escherichia coli*, *Salmonella* and yeasts and molds. The microbial quality of these products varied considerably. One imported and two domestic products were contaminated with *Salmonella*. Based on the analytical results, a three-class plan for microbial guidelines for pasta is proposed in which four parameters determine the acceptability of a product. AA

SPAGHETTI

- 3369 DEXTER (JE), MATSUO (RR) and MORGAN (BC). High temperature drying: effect on spaghetti properties. *J. Food Sci.* 46(6); 1981; 1741-6
The characteristics of spaghetti produced from two high temperature (HT) drying cycles, one featuring HT at the initial stages of drying (HT-A) and one featuring HT during the latter stages of drying (HT-B) were compared to spaghetti produced by low temperature (LT) drying. Both HT cycles had the advantage of greatly reduced drying time. In addition HT-A spaghetti exhibited much enhanced colour intensity compared to LT spaghetti. Although HT-A spaghetti cooking properties were marginally inferior to LT spaghetti, cooking quality was still satisfactory.

Spaghetti from HT-B was equal to or better than LT spaghetti in colour quality while also exhibiting improved strand strength and superior cooking properties. AA

- 3370 DEXTER (JE), MATSUO (RR) and MORGAN (BC). Effects of processing conditions and cooking time on riboflavin, thiamine and niacin levels in enriched spaghetti. *Cereal Chem.* 59(5); 1982; 328-32

MILK AND DAIRY PRODUCTS

- 3371 HARRIS (PS). Energy management in dairy plants: The UK experience. *Aust. J. Dairy Technol.* 37(2); 1982; 41-3
The attempts made by the industry to save energy at different stages - in milk transportation, liquid milk processing, heat pumps, evaporation and drying and housekeeping have been described. KAR
- 3372 WELLS (KM). Energy management cadbury schweppes: Claremont experience. *Aust. J. Dairy Technol.* 37(2); 1982; 68-70
The steps taken by the industry to save energy at various stages have been described. KAR
- 3373 RICHMOND (ML), BARFUSS (DL), HARTE (BR), GRAY (JI) and STINE (CM). Separation of carbohydrates in dairy products by high performance liquid chromatography. *J. Dairy Sci.* 65(8); 1982; 1394-400
A simple procedure is described for determination of carbohydrates commonly in dairy products. An Aminex HPX-87 carbohydrate column and refractive index detector were used to resolve lactose, glucose, and galactose in only 8 minutes. An Aminex MicroguardTM Anion/OH cartridge was used to remove interfering acids and milk salts from dairy foods. The problem of resolving lactose from sucrose on resin based systems is discussed. Applications include determination of carbohydrates in yogurt and cultured buttermilk. AA
- 3374 FITZGERALD (CH), DEETH (HC) and COGHILL (DM). Low temperature inactivation of lipases from psychrotrophic bacteria. *Aust. J. Dairy Technol.* 37(2); 1982; 51-4

MILK

- 3375 GAILOT-LAVALLEE (T), LALANDE (M) and CORRIEU (G). An optical method to study the kinetics of cleaning milk deposits by sodium hydroxide. *J. Food Process. Eng.* 5(3); 1982; 131-43
An optical sensor was devised to observe cleaning kinetics of heat exchange surfaces fouled by milk and to study the influence of some parameters on them. The sensor works by sensing the attenuation of incident light by the suspension of deposits which are removed by the cleaning solution. The cleaning is carried out without recycling the cleaning solution. The on-line collected numerical data are converted into concentration values by the use of an empirical correlation based on samples of freeze dried deposits diluted with soda solutions. The cleaning kinetics and the weight of removed fouled material are computed for each experiment

by integrating the concentration versus time curve. Over 20 experiments, carried out on a plate milk pasteurizer have established the validity of the method. The kinetics are interpreted as initially zero order, but first order at the end of the process. AA

- 3376 GAROUTTE (CA), AMUNDSON (CH) and HILL (CG) Jr. Ultrafiltration of whole milk with hollow fiber membranes. *J. Food Process. Eng.* 5(4); 1982; 191-202

The work was conducted to evaluate usefulness of ultrafiltration in cheesemaking. The variables studied included flux and its dependence on operating pressure concentration and fiber length, the composition of both process streams during concentration and the effect of several milk pre-treatments of flux. KAR

- 3377 KELLY (PM), O'KEEFFE (AM), KEOGH (MK) and PHELAN (JA). Studies of milk composition and its relationship to some processing criteria. III. Seasonal variation in heat stability of milk. *Ir. J. Food Sci. Technol.* 6(1); 1982; 29-38

Seasonal variation in heat stability of milks from creamery and liquid supplies, from spring and autumn calving herds, was determined over a 12-month period. Heat coagulation time (HCT) was measured in a thermostatically controlled oil bath at 130 C. Means values of HCT at the pH of creamery milk on reception were higher during the period April-October (78 minutes) than earlier and later periods (33 minutes). The pH of maximum heat stability occasionally coincided with the original pH of milk, but generally the stability at original pH was about 15 minutes less than the maximum. Heat stability of the autumn herd samples was similar to the spring milk in many respects, showing a seasonal rather than a lactation trend. There was a marked decrease of 20-30 minutes in the minimum HCT recorded during the November-March period for all the milks. Statistical analysis of the results indicate a significant correlation between heat stability and urea level, soluble calcium and casein number for some milks. The most significant correlation existed between maximum heat stability and urea level ($r = +0.93$) for liquid milk. Maximum heat stability was also correlated with soluble calcium ($r = -0.74$) and casein number ($r = -0.69$). AA

- 3378 SHALABI (SL) and FOX (PF). Heat stability of milk: Influence of cationic detergents on pH sensitivity. *J. Dairy Res.* 49(4); 1982; 597-605

The heat stability-pH profile of milk is shifted to more acidic values by anionic compounds such as SDS, lysolecithin and β -lactoglobulin and to more alkaline values by cationic compounds such as quaternary ammonium compounds. Proline, which reduces the hydrophobicity of proteins, destabilized milk slightly. The results suggest that the heat stability of milk and the shape of the HCT-pH curve may be dependent on micellar charge effects. AA

- 3379 SHALABI (SI) and FOX (PF). Heat stability of milk: Influence of modification of lysine and arginine on the heat stability-pH profile. *J. Dairy Res.* 49(4); 1982; 607-17

Several dicarbonyl compounds (glyoxal, substituted glyoxals, diacetyl and 1,2-cyclohexadione) had a marked stabilizing effect on the heat stability of milk, especially in the presence of urea. These reagents are believed to modify arginine more or less specifically suggesting an important role for arginine residues in heat stability. In contrast, modifi-

cation of lysine residues with dansyl chloride, acetic anhydride or cyanoborohydride had little effect on maximum heat stability although it did alter the HCT-pH profile. Since diacetyl is a natural constituent of fermented milks and cheese, it may be acceptable as an additive to increase the heat stability of milk. AA

- 3380 RAJPUT (YS), BHAVADASAN (MK), SINGH (A) and GANGULI (NC). Heat stability of buffalo milk as affected by the addition of urea and glyceraldehyde. *NZ. J. Dairy Sci. Technol.* 17(2); 1982; 185-90

Addition of urea (25, 50 and 100 mg/100 ml milk) improved heat stability in the pH region of maximum heat stability. A higher concentration of urea (200 mg/100 ml) rendered the milk unstable at all pH values. Glyceraldehyde (45 and 90 mg/100 ml milk) was effective in the pH region of minimum heat stability. A higher concentration of glyceraldehyde (180 mg/100 ml milk) helped also in enhancing heat stability in the heat coagulation time-maximum region. KAR

- 3381 SACHSE (H) and LANGHAMMER (G). Investigations on carrier fixation of milk-clotting enzymes of different origins. I. Immobilization of calf rennet. *Nahrung.* 25(3); 1981; 281-91 (German)

Partially purified calf rennet was immobilized on inorganic and organic carriers by different methods. All immobilized products lost clotting activity when used for milk coagulation. In most of the preparations, this loss of activity is connected with the liberation of free rennet in the treated milk. A partial splitting of enzyme was sometimes observed even during storage in water. This appears to be mainly due to a gradual desorption of adsorbed rennet, apart from other effects. More stable products were obtained by cross-linkage of the calf rennet covalently immobilized on alkylamine glass. KMD

- 3382 NADUDVARI-MARKUS (V), BOROSS (L), KISS (E) and VAMOS-VIGYAZO (L). Investigations on carrier fixation of milk-clotting enzymes of different origins. II. Experiments with a microbial rennet preparations. *Nahrung.* 25(3); 1981; 293-305 (German)

DEAE-cellulose prepared with a 1%, technical grade, or a purified enzyme (obtained by submerged fermentation of the mould *Endothia parasitica*) containing about 0.6 mg/ml of protein, had the highest clotting capacity. The enzyme complexes immobilized on Sepharose 4B, -AE-cellulose, Biogel, CM-100, Acrilex P-100, CM-Sephadex, Enzacryl-AA, and Enzacryl-AH were inactive; while the CM-cellulose, sand, Enzacryl-ALO, and Enzacryl-CEL complexes were active. The clotting capacities of the latter were far below those of the DEAE-cellulose-enzyme complexes. KMD

- 3383 O'KEEFFE (AM), PHELAN (JA), KEOGH (MK) and KELLY (P). Studies of milk composition and its relationship to some processing criteria. IV. Factors influencing the renneting properties of a seasonal milk supply. *Ir. J. Food Sci. Technol.* 6(1); 1982; 39-48

The rennet coagulation time (R.C.T.), curd strength and syneresis of a manufacturing milk, liquid milk and spring and autumn herd milks were determined over a fifteen-month period. The R.C.T. of the manufacturing and spring herd milks was increased and curd strength and syneresis reduced during the late lactation period (November-December). The autumn herd milk was less affected by lactation and the liquid milk supply was least affected. The addition of Ca^{++} had little effect on R.C.T. during the late lactation period. Sodium caseinate addition to cheese milk was

shown to be feasible up to 15% of total casein provided sufficient Ca^{++} was present to give a normal R.C.T. The effect of moderate heat treatment on the renneting and cheesemaking properties was also investigated. The moisture content of cheese is increased by heating only when denatured whey protein is incorporated in the curd. There is very little incorporation of whey protein under moderate over-pasteurization conditions. AA

- 3384 LABROPOULOS (AE), LOPEZ (A) and PALMER (JK). Apparent viscosity of milk and cultured yogurt thermally treated by UHT and vat systems. *J. Food Prot.* 44(11); 1981; 874-6

Apparent viscosity of ultra-high-temperature (UHT) treated milk and of yogurt prepared from this milk was studied and compared to that of vat-treated milk and yogurt. UHT-treated milks (149 C, 3.3 sec) had an apparent viscosity of 2.3 to 2.7 cp, while the apparent viscosity of vat-treated milks (63 C and 82 C, 30 minutes) ranged from 1.9 to 2.0 cp. The apparent viscosity of unheated (raw) milk was 1.7 cp. The apparent viscosity of yogurt prepared from UHT-treated milk became nearly constant at 0.8 cp after 14 minutes of shearing, while the apparent viscosity of yogurts prepared from vat-treated milks ranged from 1.8 to 3.8 cp under the same conditions. All yogurts exhibited thixotropic behaviour. AA

- 3385 PHIPPS (LW). A viscometric study of the flocculation of the components in stored, homogenized ultra-heat-treated cream. *J. Dairy Res.* 49(4); 1982; 655-64

The apparent relative viscosity (η_r) of stored, homogenized ultra-heat-treated 'coffee' cream increased with time (t) at a rate which was a function of mean fat globule diameter (d) and fat volume fraction (ϕ); the rate was also influenced by Na_2CO_3 and Na citrate when present as stabilizing additives. Viscosity increases were attributed to the progressive flocculation of fat globules and to the strengthening of the structure formed by the gradual accretion of casein micelles on to globule surfaces and their points of contact (bridging). The expression $\log (\eta_r/\eta_0) = kt/d$, where t is in days and d in μm , was found to hold over a 12-week storage period for a batch of creams ($\phi = 0.143$) of different d values prepared from the bulk cream containing carbonate and citrate stabilizers; η_0 is the relative viscosity at $t = 0$ and k is a rate parameter. In the absence of stabilizers the parameter k assumed a smaller value and so appeared to be a function of chemical composition of the cream and of forces of particle interaction; seasonal factors were also suspected of influencing k . The effect of the fat volume fraction on storage behaviour was not fully resolved, but there was some evidence that the proportionality $\log \eta_r \propto 1/\phi^{1/2}$ was appropriate. AA

- 3386 SCHRODER (MJA), COUSINS (CM) and McKINNON (CH). Effect of psychrotrophic post-pasteurization contamination on the keeping quality at 11 and 5 C of HTST-pasteurized milk in the UK. *J. Dairy Res.* 49(4); 1982; 619-30

The keeping quality of commercial HTST-pasteurized milk and laboratory pasteurized milk from a common bulk raw supply has been investigated for 5 dairies. Spoilage occurred at levels of total bacterial counts around 10^7 colony forming units/ml, but with a slightly higher off-flavour threshold for the commercial milks than the laboratory pasteurized milks. The predominant microflora at spoilage and the type of off-flavour produced differed between the 2 types of milk. Raising the storage temperature

from 5 to 11 C caused a slight shift in the spoilage microflora and led to an average reduction in the shelf life of the laboratory pasteurized milk from 28 to 6 d and of the commercial pasteurized milk from 13 to 5 d. Changes in the level of post-pasteurization contamination (PPC) were reflected in changes in keeping quality, particularly at 5 C. However, the greatest improvements were found in the absence of PPC. AA

- 3387 DAEMEN (ALH) and van der STEGE (HJ). The destruction of enzymes and bacteria during the spray-drying of milk and whey. 2. The effect of the drying conditions. *Neth. Milk Dairy J.* 36(3); 1982; 211-29

The destruction of some enzymes and bacteria during the spray-drying of milk and whey has been studied by varying several parameters such as air temperature, total solids content of the concentrate, particle size, air inclusion, and method of atomization. The outlet air temperature had a great effect, while the effect of the inlet air temperature was only slight. The effect of the former can be expressed best as a pseudo z-value; calculation of the activation energy of the destruction process was not really possible. A larger particle size was expected to lead to greater destruction, but the inclusion of air particles masked this effect. Destruction of bacteria was attributed not only to a thermal effect, but also to a non-thermal drying effect. KMD

- 3388 COGHILL (DM), MUTZELBURG (ID) and BIRCH (SJ). Effect of thermization on the bacteriological and chemical quality of milk. *Aust. J. Dairy Technol.* 37(2); 1982; 48-50

The effect of thermization on the bacteriological and chemical quality of milk was studied. Thermization effectively reduced total and psychrotrophic bacterial counts, and enabled milk to be stored for at least four days at 4 C without significant bacterial growth occurring. Thermization had no effect on the denaturation of whey protein or the stability of the caseinate complex and it stabilized pH during milk storage. AA

- 3389 BECK (CG) and HEHIR (AF). The rapid fluorescence method for counting bacteria in milk. *Aust. J. Dairy Technol.* 37(2); 1982; 66-7

A fluorescence method, taking twenty minutes to complete, has been tested and modified for milk containing 3,000-300,000 bacteria/mL. The method involves pre-treatment of the milk with Trypsin and Triton X-100 to lyse somatic cells, disperse fat globules and degrade protein sufficiently to permit filtration through a bacteria retaining membrane. The retained bacteria are then stained with the fluorescent dye, acridine orange, and the orange-yellow fluorescing bacteria counted by means of an epifluorescence microscope. When compared in a trial against 114 samples of known Standard Plate Count the technique showed excellent agreement ($r = 0.94$). AA

- 3390 ANDERSON (HC), REINECCIUS (GA) and FELSKA (BJ). Effect of lipid type on the retention of methyl ketones during spray drying of milk systems. *J. Food Sci.* 46(6); 1981; 1820-21

Methyl ketones (C_4 to C_{11}) were blended into butter, coconut, hydrogenated coconut, soyabean, or hydrogenated soyabean oil and then homogenized into condensed skim milk yielding a model system 25% fat (dry basis) and 30% total solids. The model systems were spray dried and then analyzed for ketone retention by making 2,4-dinitrophenylhydrozone derivatives followed by high-pressure-liquid chromatography. Ketone reten-

tion increased with carbon chain length up to 2-octanone and then was constant. There were significant differences in ketone retention between fats with coconut providing the best retention and soyabean oil the poorest. AA

- 3391 RICHMOND (ML) and STINE (CM). Historical aspects of packaging fluid milk in the United States. *J. Dairy Sci.* 56(8); 1982; 1666-72

- 3392 PHELAN (JA), O'KEEFFE (AM), KEOGH (MK) and KELLY (PM). Studies of milk composition and its relationship to some processing criteria. I. Seasonal changes in the composition of Irish milk. *Ir. J. Food Sci. Technol.* 6(1); 1982; 1-11

Seasonal variations in the gross composition, nitrogenous fractions and free fatty acid (FFA) levels of milk samples from 4 different sources: bulk creamery, bulk liquid, spring and autumn calving herds were determined over a 12 month period. Lactational influences were evident in the variations of fat, lactose and proteose-peptone fractions while seasonal effects predominated in the case of total protein, nonprotein nitrogen and urea levels. In creamery milks, FFA levels were inversely proportional to the volume of milk supply. Of the four milk types tested, bulk creamery milk showed greatest variability in fat content (range 3.22-5.27%) with the maximum and minimum values occurring during November and March, respectively. The range of total protein was greater for the creamery and spring herd milks. Total protein values for the autumn herd milk were approximately 0.2% higher than for the spring herd in January/February while the liquid and creamery milks were similar in protein content. The composition of bulk liquid milk at any stage in the year was intermediate between those of the spring and autumn calving herd milks, which reflected the even calving pattern of herds supplying the liquid milk trade. AA

- 3393 KEOGH (MK), KELLY (PM), O'KEEFFE (AM) and PHELAN (JA). Studies of milk composition and its relationship to some processing criteria. II. Seasonal variation in the mineral levels of milk. *Ir. J. Food Sci. Technol.* 6(1); 1982; 13-28

Seasonal changes in levels of the various mineral species of milk from creamery, liquid and spring and autumn herd milks were determined over a 12-month period. Changes were predominantly lactational and in liquid (i.e. market) milks, where the calving pattern is more evenly spread throughout the season, changes were small. In contrast, changes in the creamery and herd milks were more like those found in other studies in individual cow milks and were very marked for some mineral species in late lactation samples. The calcium ion levels of the milks remained within a narrow range throughout the year in all milks except for some raised levels in aged samples of creamery milks in December-January and some low levels in autumn herd samples in January and February. Citrate levels were influenced mainly by the quality of feed but late lactation values were also low in the creamery and spring herd milks. AA

- 3394 FOX (PF) and MULVIHILL (DM). Milk proteins: Molecular, colloidal and functional properties. *J. Dairy Res.* 49(4); 1982; 679-93

- 3395 AZUMA (N), KAMINOGAWA (S), KOBAYASHI (H) and YAMAUCHI (K). Identification of a calcium-binding protein in human milk as α -lactalbumin. *J. Dairy Sci.* 65(8); 1982; 1401-7

- 3396 KOROLAZUK (J), Viscosity and hydration of neutral and acidic milk protein concentrates and caseins. *NZ. J. Dairy Sci. Technol.* 17(2); 1982; 135-40

Neutral milk protein concentrate (NMPC), pH 6.5, was obtained from skim milk by ultrafiltration and spray drying while acidic milk protein concentrate (AMPC), pH 2.5, was obtained from skim milk by cation exchange resin treatment prior to ultrafiltration and drying. The above materials, together with acidified casein and sodium caseinate, were dissolved in water or 2.5% sodium tetraborate (borax) and the viscosity as a function of concentration was determined. NMPC dissolved in borax had the highest viscosity while AMPC in borax had the lowest. Caseinate and acidified casein dissolved in borax had lower viscosities than acidified casein dissolved in water (pH 2.5-3.6). The protein hydration level was 2.6, 3.1 and 4.9 g H₂O/g protein respectively, for NMPC and AMPC dissolved in borax buffer and AMPC dissolved in water. The AMPC and acidified casein dissolved in water (pH 2.5-3.6) to form clear gels when the protein concentration was over 10%. AA

- 3397 SCHUT (J). Functions and use of milk proteins in other foods. *Ind. Aliment.* 20(181); 1981; 185-98 (Italian)

After reporting the compositions of the serum-protein fractions of bovine milk, and of products like sodium caseinate, edible acid casein, 50% demineralized serum, and 50% de-lactosed serum the author has discussed the applications of these products in: (i) stabilization, or prevention or reduction of loss of water; (ii) emulsions for the prevention or reduction of loss of fat; (iii) stabilization with ionic emulsifiers; (iv) stabilization with compact particles; (v) stabilization with polymers; and (vi) the use of milk products in various kinds of foods. KMD

- 3398 PERI (C), BARBIERI (R) and CASIRAGHI (EM). Physical, chemical and nutritional quality of extruded corn germ flour and milk protein blends. *J. Food Technol.* 18(1); 1983; 43-52

An expanded nutrient snack was prepared by extrusion cooking of de-fatted corn germ flour added with increasing amounts of milk proteins. Two extrusion temperatures (150 and 170 C) were considered. Physical, chemical and nutritional characteristics of the final product were evaluated. The products extruded at 150 C showed better expansion and crispness than the ones obtained at 170 C. A small addition of milk protein (5%) improves the organoleptic characteristics of the extrudates produced at 150 C. On the contrary the addition of milk protein has a negative influence on the product expansion and consistency of the samples extruded at 170 C. AA

- 3399 LAAKSO (S) and LILUS (E-M). Milk casein: Inhibitor of lipoxxygenase-catalyzed lipid peroxidation. *J. Agric. Food Chem.* 30(5); 1982; 913-6

- 3400 PAYENS (T AJ). Stable and unstable casein micelles. *J. Dairy Sci.* 65(10); 1982; 1863-73

- 3401 CHAPLIN (B) and GREEN (ML). Probing the location of casein fractions in the casein micelle using enzymes and enzyme-dextran conjugates. *J. Dairy Res.* 49(4); 1982; 631-43

- 3402 AIMUTIS (WR), KORNEGAY (ET) and EIGEL (WN). Electrophoretic and biochemical comparison of casein and whey protein from porcine colostrum and milk. *J. Dairy Sci.* 65(10); 1982; 1874-81
- 3403 THELWALL (LAW). Recent aspects of the chemistry of lactose. *J. Dairy Res.* 49(4); 1982; 713-24
 Regioselective esterification and acetalation reactions of lactose have produced partly protected derivatives which have significant value in the further modification of lactose and as precursors for the synthesis of higher oligosaccharides. AA
- 3404 HOHNO (H) and ADACHI (S). Disaccharide formation in thermal degradation of lactose. *J. Dairy Sci.* 65(8); 1982; 1421-7
- 3405 HIGGINS (JJ) and LORIMER (PR). Flavour characteristics of crude lactose. *NZ. J. Dairy Sci. Technol.* 17(2); 1982; 91-101
 The effects of demineralization, neutralization by Ca(OH)_2 and NaOH and subsequent clarification in the flavour characteristics of the spray dried crude lactose were examined. Demineralization reduced saltiness, and sourness and increased sweetness. Neutralization reduced sourness and increased sweetness as also chalkiness, clarification removed chalkiness. KAR
- 3406 WRIGHT (SL) and RICHARDSON (GH). Optimization of whey-based or nonfat dry milk-based media for production of pH controlled bulk lactic cultures. *J. Dairy Sci.* 65(10); 1982; 1882-9
- 3407 LAMB (JM) and COOKE (MD). Comparative evaluation of the STAR test method with the Difco disc-assay method for detecting inhibitory substances in raw milk. *Food Technol. NZ.* 17(11); 1982; 20-21
 It was found that the Difco assay method using *B. stearothermophilus* and PM indicator agar is superior to STAR tests in terms of simplicity, cost, and ease of clean up. KAR
- 3408 JOHNSTON (KA). Evaluation of the multispec instrument for infra-red, estimation of milkfat, protein and lactose in raw milk. *NZ. J. Dairy Sci. Technol.* 17(2); 1982; 141-6
- 3409 van VLIET (T) and DENTENER-KIKKERT (A). The influence of the composition of the milk fat globule membrane on the rheological properties of acid milk gels. *Neth. Milk Dairy J.* 36(3); 1982; 261-5
 The addition of milk fat globules surrounded by the natural membrane results in a weaker milk gel. In contrast, the stiffness increases sharply in the presence of small deformations, resulting from the addition of recombined milk fat globules in the milk. In this case, nodal points are formed - unlike the case of "natural" milk fat globules - between the absorbed casein and the gel matrix which also consists of casein. KMD
- 3410 KERKHOF MOGOT (MF), KOOPS (J), NEETER (R), SLAGEN (KJ), van HEMERT (H), KOOYMAN (Q) and WOOLDRIK (H). Routine testing of farm tank milk with the Milko-Scan 203. Part 2. Fat and protein contents of individual supplies compared with those obtained by Gerber (fat) and dye-binding (protein). Annual yields in fat and protein and computer calculations on frequency of testing needed. *Neth. Milk Dairy J.* 36(3); 1982; 195-210

The results of routine tests of the fat and protein content (M Sc FP) of more than 5000 individual tank milk supplies were studied, and evaluated statistically. These data were then compared with the values obtained by the Gerber (G) and dye-binding (DbP) method. Selected suppliers (n=34) were followed over a period of one year to establish if more or less regularly occurring (M Sc F - G) differences of $\geq \pm 0.1\%$ had any effect on milk payment. Finally, computer calculations were carried out to establish the frequency of testing needed. KMD

- 3411 THOMPSON (JN), HATINA (G), MAXWELL (WB) and DUVAL (S). High performance liquid chromatographic determination of vitamin D in fortified milks, margarine and infant formulas. *J. Assoc. Off. Anal. Chem.* 65(3); 1982; 624-31
- 3412 HARDY (J) and FANNI (J). Application of reflection photometry to the measurement of milk coagulation. *J. Food Sci.* 46(6); 1981; 1956-7
- 3413 CHAMBERS (G). The possible contributions of the dairy industry to innovations in food and drinks over the next decade. *IFST Proc.* 15(3 Pt.1); 1982; 112-9
- Under the factors influencing innovation in milk-based foods and drinks, the aspects covered include changing market requirements, the availability and versatility of raw material, the economic aspect of better use of dairy products, availability of new technologies and the level of R&D effort. KAR
- 3414 DE KONING (PJ) and VAN ROOIJEN (PJ). Aspects of the formation of lysino-alanine in milk and milk products. *J. Dairy Res.* 49(4); 1982; 725-36
- 3415 BURGESS (KJ). Ion exchange processing of skim-milk for food use. *J. Dairy Res.* 49(4); 1982; 749
- 3416 MARSHALL (VM). Flavour compounds in fermented milks. *Perfumer Flavour.* 7(2); 1982; 27-34
- Discusses: fermented milks of type I, II, III and IV; lesser known fermented milks; flavour differences in milks; and modern methods for assessment of quality. BSN

MILK POWDER

- 3417 TIMMS (RE), ROUPAS (P) and ROGERS (WP). Determination of oxidative deterioration of milk powder and reconstituted milk by measurement of chemiluminescence. *J. Dairy Res.* 49(4); 1982; 645-54
- 3418 BLOORE (CG) and BOAG (IF). The effect of processing variables on spray dried milk powder. *NZ. J. Dairy Sci. Technol.* 17(2); 1982; 103-20
- Equations were obtained relating the concentrate viscosity to the temperature, total solids and protein content of the concentrate, and this viscosity to the pressure flowrate relationship of the atomizing nozzle used. Regression equations relating to moisture content solubility index, bulk density, particle density, and particle size of skim milk powder to the drier operating variables were fitted to the experimental data. These variables proved to be sufficient to describe the drier performance and to predict the properties of the powder. KAR

- 3419 STADHOUDERS (J), HUP (G) and HASSING (F). The conceptions index and indicator organisms discussed on the basis of the bacteriology of spray-dried milk powder. *Neth. Milk Dairy J.* 36(3); 1982; 231-60

The question discussed in this paper is whether there is always a real need to look for suitable index organisms, or whether it is preferable to search for pathogens directly. The main point is whether a clear distinction can be made in foods between index and indicator organisms. Spray-dried milk powder is the example that has been studied in this context. The second part of the paper explains why there is no direct need to look for suitable index organisms, particularly if a good method is available to determine the pathogens, and if these pathogens are well distributed in the food. The situation in a product processing line, or in a food, differs from that found in river water contaminated with city waste water. The number of treatments, the (in-line) recontamination of the product, and the possibility of growth prevent the establishment of a reliable and well-defined relationship between pathogens and index organisms. KMD

- 3420 DOERR (RC), GATES (RA) and FIDDLER (W). Chemiluminescence detection of nitrite in nonfat dry milk powders. *J. Assoc. Off. Anal. Chem.* 65(3); 1982; 616-8

Determination of nitrite in nonfat dry milk powders by chemiluminescence detection was compared with a colorimetric method specifying Griess reagents. The chemiluminescent technique requires no sample preparation, is free from apparent interferences, and is sensitive to 25 ppb nitrite. Statistical analysis shows no difference at $P = 0.05$ between the colorimetric and chemiluminescent methods, based on the analysis of 16 commercial nonfat dry milk samples. AA

CHHANA

- 3421 KUMAR (G) and SRINIVASAN (MR). Effect of packaging and storage on the sensory characteristics of chhana. *NZ. J. Dairy Sci. Technol.* 17(2); 1982; 171-6

The sensory evaluation of three types of Chhana (an acid-coagulated Indian milk product) samples stored in four different types of packages at 37 ± 0.5 C and 60% relative humidity (RH) and 4-5 C and 100% RH for various time intervals revealed that the four types of packages, the three types of Chhana and the duration of storage, all individually had significant effects on the sensory scores of Chhana under the two conditions of storage. AA

YOGURT

- 3422 BRAY (F). Yogurt and ice-cream. *Gordian.* 81(11); 1981; 266 & 268
- The common features in the preparation of yogurt and ice-cream have been pointed out. A fundamental formulation for yogurt has been given, as also a formulation and process for (a) yogurt ice-cream, and (b) fruit yogurt ice-cream. KMD

- 3423 MARSHALL (VM), COLE (WM) and VEGA (JR). A yogurt-like product made by fermenting ultrafiltered milk containing elevated whey proteins with *Lactobacillus acidophilus*. *J. Dairy Res.* 49(4); 1982; 665-70

A fermented milk with typical yogurt flavour and aroma was prepared using a human strain of *Lactobacillus acidophilus*. Growth of the lactobacillus was stimulated when the whey proteins of the ultrafiltered skim-milk substrate were increased by addition of ultrafiltered Cheddar cheese whey. Fermentation, which was carried out at 37 C, was accelerated by addition of lactase. The resulting product had a smooth consistency, a pH of 4.2, acetaldehyde levels up to 15 ppm, and no off-flavours. *L. acidophilus* remained viable at a level of approx. 10^8 colony forming units/ml. with no impairment of quality for up to 14 d at 4 C. AA

- 3424 KOSIKOWSKI (FV). Properties of commercial flavoured frozen yogurts. *J. Food Prot.* 44(11); 1981; 853-6

A study was made of the composition, acidity, bacterial levels and related characteristics of 34 flavoured frozen yogurts obtained in the Northeast United States from various sources. Wide variations were observed. pH of frozen yogurts varied from 4.0 to 6.5 and titratable acidity from 0.31 to 1.27%. Most brands of frozen yogurt had a pH of 4.4 or lower and a titratable acidity above 0.9% with accompanying typical flavour and tartness. AA

- 3425 HYVONEN (L) and SLOTTÉ (M). Alternative sweetening of yogurt. *J. Food Technol.* 18(1); 1983; 97-112

BUTTER

- 3426 O'CONNOR (JF) and SYNNOTT (EC). Seasonal variation in dielectric properties of butter at 15 MHz and 4 C. *Ir. J. Food Sci. Technol.* 6(1); 1982; 49-59

The seasonal variation in dielectric constant (ϵ'), loss factor (ϵ''), loss angle ($\tan \sigma$) and conductance (σ) was obtained for 40 samples, spread over a year, of commercially manufactured butter from a continuous buttermarker. The percentage range of moisture contents was from 13.8 to 17.4 and salt content from 1.32 to 2.23. The test parameters were 15MHz and 4 C and a substitution-type resonance circuit method was used. The range of values for ϵ' was 4.8 (February) to 10.1 (April); for ϵ'' , 0.25 (February) to 4.79 (April; for $\tan \delta$ 0.052 (November) to 0.48 (April) and for σ , 43 (February) to 832 (April). Average monthly values for each variable were also obtained. All variables had very large peak values in April and it was noted that these corresponded to very definite minimum values of percentage solid fat content in the butter. However, apart from this correspondence in April, no significant relationship could be established for any of the dielectric properties with percentage solid fat content, either on an individual or monthly average basis. AA

WHEY

- 3427 LOVELL-SMITH (JER). Submerged combustion for the concentration of whey. *NZ. J. Dairy Sci. Technol.* 17(2); 1982; 161-70

Whey was concentrated in two pilot scale submerged combustion evaporation plants fired with natural gas. It proved feasible to concentrate the whey to total solids concentrations of 60%. KAR

- 3428 KELLY (P). Effect of ion-exchange removal of whey protein on the heat stability of skim milk. *Ir. J. Food Sci. Technol.* 6(1); 1982; 91-6
- An ion-exchange system developed for the recovery of protein from whey was applied to skim milk. The whey protein-free skim milk eluate was substantially more heat stable than the original milk, and the heat coagulation time 'minimum' was eliminated. The heat stability of this fraction when concentrated was also greater than that produced by conventional methods from skim milk. AA

CHEESE

- 3429 METWALLI (NH), SHALABI (SI), ZAHRAN (AS) and EL-DEMERDASH (O). The use of soyabean milk in soft cheese making. II. Organoleptic and chemical properties of Domiati cheese made from a mixture of soyabean milk and whole milk. *J. Food Technol.* 17(3); 1982; 297-305
- 3430 BRESSAN (JA), CARROAD (PA), MERSON (RL) and DUNKLEY (WL). Temperature dependence of effective diffusion coefficient for total solids during washing of cheese curd. *J. Food Sci.* 46(6); 1981; 1958-9
- The temperature dependence of the effective diffusion coefficient of total solids from small curd cottage cheese was estimated by fitting batch washing data at several temperatures (25 C, 35 C, 50 C and 58 C) to a previously developed mass transfer model. The model was based on spherical geometry of curd particles. The correlation for diffusivity was found to be $D_{\text{effective}} = (0.0658T + 1.72) \times 10^{-6}$, where $D_{\text{effective}}$ is in cm^2/sec . and T is in $^{\circ}\text{C}$. AA
- 3431 MALTHLOUTHI (M), MICHEL (JF) and MAITENAZ (PC). Study of some factors affecting water vapour sorption of gruyere cheese. I. Proteolysis. *Food Sci. + Technol.* 14(3); 1981; 163-5
- Among the factors which changes during gruyete cheese ripening, the degree of proteolysis appears to be one of the most important as for its action on water vapour sorption. This work allowed us to establish a relation between water sorption capacity and the degree of proteolysis of the cheese. We also have been able to improve our knowledge of the state of organization of water in gruyere cheese. The temperature effect on water vapour sorption which we have previously related to water structure seems to depend on the dry substance quality, especially the degree of proteolysis. AA
- 3432 GREEN (ML) and MANNING (DJ). Development of texture and flavour in cheese and other fermented products. *J. Dairy Res.* 49(4); 1982; 737-48
- 3433 JARRETT (WD), ASTON (JW) and DULLEY (JR). A simple method for estimating free amino acids in cheddar cheese. *Aust. J. Dairy Technol.* 37(2); 1982; 55-8
- A method for the estimation of free amino acids in Cheddar cheese, combining extraction with phosphotungstic acid (PTA)/sulphuric acid and determination with trinitrobenzene-sulphonic acid, was investigated. Although it was found that the dibasic amino acids and proline were not measured and that some peptide material was being measured, the PTA-soluble amino nitrogen level exhibited a linear relationship with total amino acids extracted from the cheese. This could be partly explained by the fact that, while free amino acid level increased with the age of the

cheese, the relative proportion of each amino acid remained essentially constant. The method, therefore, offers a simple inexpensive means of estimating total free amino acids in Cheddar cheese. AA

- 3434 ASTON (JA) and DULLEY (JR). Cheddar cheese flavour. *Aust. J. Dairy Technol.* 37(2); 1982; 59-64
The contributions of compounds like amino acids, carbonyl compounds, fatty acids, sulphur compounds like hydrogen sulphide, methional methanethiol, dimethyl sulphide and other compounds to cheddar cheese flavour have been considered separately. KAR
- 3435 EL-SAFETY (MS) and ISMAIL (AA). Addition of free fatty acids to improve the flavour and to accelerate the ripening of Domiati cheese made from reconstituted milk. *J. Dairy Res.* 49(4); 1982; 671-5
- 3436 TODD (E), SZABO (R), ROBERN (H), GLEESON (T), PARK (C) and CLARK (DS). Variation in counts, enterotoxin levels and TNase in Swiss-type cheese contaminated with *Staphylococcus aureus*. *J. Food Prot.* 44(11); 1981; 839-46, 851-2, 856

ICE CREAM

- 3437 TRANSFELD (O) and SCHULZE (O). Ice cream dessert. New product from the VEB kombinat oil and margarine. *Lebensmittelindustrie.* 28(2); 1981; 85-8 (German)
Ice cream dessert - a new product - differs from ice cream with regard to its eating temperature and to its consistency and drip properties. The manufacture is divided into the technological stages, known for ice-cream. Peculiarities arise from the large amounts of emulsifiers and stabilizers for mixing, cooling and filling. The article deals with two tested mixing methods. The standards and production scheme which were worked out, assure a steady quality of the product. AA

MEAT AND POULTRY

- 3438 ACTON (JC), ZIEGLER (GR) and BURGE (DL) Jr. Functionality of muscle constituents in the processing of comminuted meat products. *CRC Crit. Rev. Food Sci. Nutr.* 18(2); 1982; 99-121
Discusses: muscle proteins and water relations; fat phase relations; rheological behaviour at comminution; and heating effects. BSN
- 3439 WEST (RL). Functional characteristics of hot-boned meat. *Food Technol.* 37(5); 1983; 57-9, 61, 64-6
Hot boning which is the removal of muscle from the carcass prior to chilling is described. Aspects covered include the effects of hot-boning treatments involving temperature, time and pH controls to alleviate muscle shortening on functional characteristics of primal cuts, ground beef and cooked sausage products. KAR
- 3440 CULIOLI (J), NOEL (P) and GOUTEFONGEA (R). Spinning of plant and blood protein mixtures. I. Colouration of protein fibres by nitrosylhemoglobin. *Sci. Aliment.* 1(2); 1981; 169-85 (French)

Coloured protein fibres have been obtained by spinning hemoglobin and fababean protein mixed in the same dope, so as to obtain spun protein products similar in colour to meat products. Hemoglobin was stabilized by action of nitrite. The nitrosylation of the heme was achieved either before incorporation of hemoglobin into the spinning dope or after spinning by soaking the fibres in a brine. In both cases, the colouration studied by reflectometry was satisfactory. The influence of pigment concentration, curing and storage conditions has been studied. The characteristics of the colour of the spun products could be modified in a large range including those of cooked ham and red meat. Whatever the process, the fibres had free nitrite contents lower than those generally found in traditional cured meat products. AA

- 3441 LEE (CM), CARROLL (RJ) and ABDOLLAHI (A). A microscopical study of the structure of meat emulsions and its relationship to thermal stability. *J. Food Sci.* 46(6); 1981; 1789-93, 1804

- 3442 SANTOS-BUELGA (C), NOGALES-ALARCON (A) and MARINE-FONT (A). A method for the analysis of tyramine in meat products: Its content in some Spanish samples. *J. Food Sci.* 46(6); 1981; 1794-5

Tyramine is determined quantitatively by fluorometry once the corresponding fluorophore has been formed by reacting the final extract with α -nitrous- β -naphthol. Qualitative confirmation is carried out by spectrofluorometry and thin-layer chromatography. The average recovery was 88.80% and the relative standard deviation 6.35%. The method has been applied to 15 Spanish meat products, the amounts found oscillating between 0.13 and 301.20 $\mu\text{g/g}$. AA

- 3443 BJARNO (O-C). Multicomponent analysis of meat products by infrared spectrophotometry. *J. Assoc. Off. Anal. Chem.* 65(3); 1982; 696-700

A new method for rapid multicomponent analysis of meat products based on infrared transmission was tested in a collaborative study with 4 laboratories. A series consisting of 31 samples of different meats, cooked sausage, liver sausage, and fermented sausage was distributed and analyzed at all laboratories for protein, fat, and water by the present method and by well established reference methods. There was no significant difference between the infrared method and reference methods at the 95% confidence level for determination of protein, fat, and water in meat products. AA

- 3444 SKJOLDEBRAND (C), ANAS (A), OSTE (R) and SJODIN (P). Prediction of thiamine content in convective heated meat products. *J. Food Technol.* 18(1); 1983; 61-73

- 3445 REINDL (B) and STAN (H-J). Determination of volatile aldehydes in meat as 2,4-dinitrophenylhydrazones using reversed-phase high-performance liquid chromatography. *J. Agric. Food Chem.* 30(5); 1982; 849-54

Volatile aldehydes formed by oxidative degradation of unsaturated fatty acids were isolated from meat and determined as 2,4-dinitrophenylhydrazones (DNPHs). Meat samples were homogenized in ethanol and the volatile aldehydes distilled under vacuum into a trap filled with 2,4-dinitrophenylhydrazine. The derivatization took place in a two-phase reaction with acidic ethanol solution and hexane. The recovery of aldehydes with more than five carbon atoms is better than 80% at trace concentrations (micrograms per gram). Determination is carried out by

reversed-phase HPLC on C₁₈-RP columns with the eluent acetonitrile-water-tetrahydrofuran (75:24:1) at 50 C using photometric detection at 360 nm. The HPLC method was optimized for the determination of volatile aldehydes formed during oxidative degradation of the unsaturated fatty acids occurring in food. The detection limit at 360 nm was found to be 5 pmol. The utility of the method for the detection of beginning oxidative rancidity was demonstrated with a storage experiment of frozen pork liver. AA

- 3446 JOHNSTON (RW), REAMER (RH), HARRIS (EW), FUGATE (HG) and SCHWAB (B). A new screening method for the detection of antibiotic residues in meat and poultry tissues. *J. Food Prot.* 44(11); 1981; 828-31

- 3447 TIWARI (NP) and KADIS (VW). Microbiological quality of some delicatessen meat products. *J. Food Prot.* 44(11); 1981; 821-7

- 3448 MARRIOTT (NG), LECHOWICH (RV) and PIERSON (MD). Use of nitrite and nitrite-sparing agents in meats: A review. *J. Food Prot.* 44(11); 1981; 881-5

This review focuses on the efficacy of various curing methods using nitrites that have the goal of reducing formation of nitrosamines. AA

- 3449 PIERSON (MD) and SMOOT (LA). Nitrite, Nitrite alternatives, and the control of *Clostridium botulinum* in cured meats. *CRC Crit. Rev. Food Sci. Nutr.* 17(2); 1982; 141-87

Discusses: background; use of sodium nitrite in cured meats; control of *C. botulinum*; and potential substitutes for nitrites. BSN

- 3450 ROBERTS (TA), GIBSON (AM) and ROBINSON (A). Factors controlling the growth of *Clostridium botulinum* types A and B in pasteurized, cured meats. III. The effect of potassium sorbate. *J. Food Technol.* 17(3); 1982; 307-26

- 3451 BUSTA (FF). Combined effects of sorbic acid and other inhibitory factors in cured meat products. *Food Technol. Aust.* 34(11); 1982; 529-32

Antimicrobial action of sorbic acid in cured meat products is influenced by numerous factors associated with composition, processing and storage. Sorbic acid in combination with other antagonistic conditions, such as reduced pH, nitrite and polyphosphates produces increased stability and safety. The fragility of certain antimicrobial systems and their sensitivity to minor changes mandate comprehensive evaluations of all product modifications. AA

- 3452 PORRINI (M), TESTOLIN (G), CANTONI (C) and RENON (P). Mutagenicity and n-nitroso-compounds in meat and vegetable extracts. *Ind. Aliment.* 20(181); 1981; 174-6 (Italian)

The authors have determined N-nitroso compounds in 4 commercial samples of meat extracts and 3 commercial samples of vegetable extracts, using colorimetric and gas-chromatographic methods. All the samples had less than 0.2 ppm of N-nitroso compounds, while nitrites and nitrates were present in large quantities. KMD

- 3453 UNKLESBAY (N), UNKLESBAY (K), BUERGLER (D) and STRINGER (W). Bentonite-water dispersions simulate food service energy consumption of sausage patties. *J. Food Sci.* 46(6); 1981; 1808-9, 1816

- 3454 WILLS (RBH) and KABIRULLAH (M). Use of sunflower protein in sausages. *J. Food Sci.* 46(6); 1981; 1657-8
- 3455 WHITING (RC) and JENKINS (RK). Comparison of rabbit, beef and chicken meats for functional properties and frankfurter processing. *J. Food Sci.* 46(6); 1981; 1693-6
- 3456 JONSSON (L) and KARLSTROM (B). Effect of frying and warm-holding on protein quality linoleic acid content and sensory quality of hamburgers. *Food Sci. + Technol.* 14(3); 1981; 127-30

BEEF

- 3457 JOHNSTON (DM), MOODY (WG), BOLING (JA) and BRADLEY (NW). Influence of breed type, sex, feeding systems, and muscle bundle size on bovine fiber type characteristics. *J. Food Sci.* 46(6); 1981; 1760-65
- 3458 ETHERIDGE (PA), HICKSON (DW), YOUNG (CR), LANDMANN (WA) and DILL (CW). Functional and chemical characteristics of bovine plasma proteins isolated as a metaphosphate complex. *J. Food Sci.* 46(6); 1981; 1782-4, 1788
- 3459 KUNSMAN (JE), COLLINS (MA), FIELD (RA) and MILLER (GJ). Cholesterol content of beef bone marrow and mechanically deboned meat. *J. Food Sci.* 46(6); 1981; 1785-8
- 3460 CROSS (HR), SMITH (GC), ABRAHAM (HC) and MURPHEY (CE). Equations for estimating cutability of beef wholesale cuts. *J. Food Prot.* 44(11); 1981; 857-60
- 3461 McKEITH (FK), SAVELL (JW) and SMITH (GC). Tenderness improvement of the major muscles of the beef carcass by electrical stimulation. *J. Food Sci.* 46(6); 1981; 1774-6
- 3462 SAVELL (JW), McKEITH (FK) and SMITH (GC). Reducing postmortem aging time of beef with electrical stimulation. *J. Food Sci.* 46(6); 1981; 1777-81
- 3463 KASTNER (CL). Optimal hot-processing systems for beef. *Food Technol.* 37(5); 1983; 96-100,102,104
- 3464 SNIDER (S) and BALDWIN (RE). Flavour intensity as related to the creatine and creatinine content of microwave and conventionally cooked beef. *J. Food Sci.* 46(6); 1981; 1801-4
- 3465 HAYDEN (AR). Use of antisera to heat-stable antigens of adrenals for species identification in thoroughly cooked beef sausages. *J. Food Sci.* 46(6); 1981; 1810-13
- 3466 WHITBURN (KD), HOFFMAN (MZ) and TAUB (IA). A re-evaluation of the products of gamma irradiation of beef ferrimyoglobin. *J. Food Sci.* 46(6); 1981; 1814-6
- 3467 YADA (RY) and SKURA (BJ). Some biochemical changes in sarcoplasmic depleted, intact beef muscle inoculated with *Pseudomonas fragi*. *J. Food Sci.* 46(6); 1981; 1766-73, 1776

- 3468 ERICHSEN (I) and MOLIN (G). Microbial flora of normal and high pH beef stored at 4 C in different gas environments. *J. Food Prot.* 44(11); 1981; 866-9, 873
- 3469 GREER (GG). Rapid detection of psychrotrophic bacteria in relation to retail beef quality. *J. Food Sci.* 46(6); 1981; 1669-72
- 3470 REAGAN (JO), STRIBLING (KV), CARPENTER (JA) and CAMPION (DR). Microbiological vacuum packaging and palatability attributes of beef produced at varied levels of forages and grain. *J. Anim. Sci.* 53(6); 1981; 1482-8
- 3471 SAVELL (JW), HANNA (MO), VANDERZANT (C) and SMITH (GC). An incident of predominance of *Leuconostoc* Sp. in vacuum-packaged beef strip lions. Sensory and microbial profile of steaks stored in O₂-CO₂-N₂ atmospheres. *J. Food Prot.* 44(10); 1981; 742-5
- 3472 MATA-HERNANDEZ (A), MARCHELLO (JA), ROUBICEK (CB), OCHOA (MF), BENNETT (JA) and GORMAN (WD). Quantitative estimates of beef carcass composition from specific gravity measurements and certain carcass traits of feedlot steers. *J. Anim. Sci.* 53(5); 1981; 1246-55
- 3473 OBLINGER (JL). Microbiology of hot-boned beef. *Food Technol.* 37(5); 1983; 86,88,90-94
Hot boning with and without electrical stimulation on the microbiological quality of resultant product has been discussed. KAR
- 3474 EL-ENZARY (MM), ASKAR (AA), EL-DASHLOUTY (MS) and ABD EL-BAKI (MM). Evaluation of alginate coatings for frozen-stored buffalo meat cuts. *Gordian.* 81(12); 1981; 287-92
Buffalo meat cuts were kept under frozen storage (-18 C) for 6 months, (a) unwrapped, (b) wrapped in polyethylene bags, (c) coated with alginate film, (d) coated with dried alginate film, or (e) wrapped in polyethylene bags, after coating with alginate film. Treatments (c) and (d) were equally effective in preventing moisture loss; while treatment (e) was only slightly more effective. Meat treated as in (a) and (b) showed a marked loss of moisture. Alginate coating also reduced the loss of total N during storage; improved the water-holding capacity, texture, and colour of the frozen-stored meat; and reduced the drip loss, thiobarbituric acid value, total volatile nitrogen, ammonia, and total bacterial count during frozen storage. Drying of the alginate film seemed to be unnecessary with regard to the quality of frozen-stored meat. KMD
- 3475 WU (JJ), KASTNER (CL), HUNT (MC), KROPF (DH) and ALLEN (DM). Nutritional effects on beef collagen characteristics and palatability. *J. Anim. Sci.* 53(5); 1981; 1256-61
- 3476 MOODY (WG). Beef flavour. A review. *Food Technol.* 37(5); 1983; 227-32, 238
- 3477 MELTON (SL). Effect of forage feeding on beef flavour. *Food Technol.* 37(5); 1983; 239-48
- 3478 KRAFT (AA), REDDY (KV), SEBRANEK (JG), RUST (RE) and HOTCHKISS (DK). Effect of combinations of fresh and frozen beef on microbial flora of ground beef patties. *J. Food Prot.* 44(11); 1981; 870-73

- 3479 BOOREN (AM), MANDIGO (RW), OLSON (DG) and JONES (KW). Effect of muscle type and mixing time on sectioned and formed beef steaks. *J. Food Sci.* 46(6); 1981; 1665-8, 1672
- 3480 BOOREN (AM), MANDIGO (RW), OLSON (DG) and JONES (KW). Vacuum mixing influence on characteristics of sectioned and formed beef steak. *J. Food Sci.* 46(6); 1981; 1673-7
- 3481 BOOREN (AM), JONES (KW), MANDIGO (RW) and OLSON (DG). Effects of blade tenderization, vacuum mixing, salt addition and mixing time on binding of meat pieces into sectioned and formed beef steaks. *J. Food Sci.* 46(6); 1981; 1678-80
- 3482 OCKERMAN (HW) and CRESPO (FL). Stability of precured beef blends. *J. Food Sci.* 46(6); 1981; 1944-5
- 3483 RAY (FK), PARRETT (NA), Van STAVERN (BD) and OCKERMAN (HW). Effect of soy level and storage time on the quality characteristics of ground beef patties. *J. Food Sci.* 46(6); 1981; 1662-4
- 3484 OCKERMAN (HW), PIERSON (CJ) and HODGES (RK). Design and evaluation of a modified shear head for the Warner-Bratzler shear to evaluate tenderness of cooked ground beef patties. *J. Food Sci.* 46(6); 1981; 1948-9
- 3485 APPLE (JM) and TERLIZZI (FM) Jr. Packaging systems for hot-boned beef. *Food Technol.* 37(5); 1983; 68,70,72,74,76-7
Aspects covered include the process of packaging, packaging materials both for primary and secondary packaging, packaging machinery including those for nozzle vacuumizing, chamber vacuumizing; controlled atmosphere systems, vacuum packaging process for hot boned meat; and the future challenges with regard to this type of packaging. KAR

LAMB

- 3486 RILEY (ML), BOTKIN (MP), FIELD (RA), RADLOFF (HA) and WIELAND (DA). Effect of physical form of the diet and stress on carcass characteristics of lamb. *J. Anim. Sci.* 53(6); 1981; 1489-95
- 3487 DANI (NP). Improvement of sheep for mutton quality. *Indian Food Ind.* 1(3); 1982; 91-4
- 3488 NERENBERG (C), TSINA (I) and MATIN (S). Radioimmunoassay of oxfendazole in sheep fat. *J. Assoc. Off. Anal. Chem.* 65(3); 1982; 635-9
- 3489 CRAMER (DA). Chemical compounds implicated in lamb flavour. *Food Technol.* 37(5); 1983; 249-57
Aspects covered include tissue source of flavour compounds; neutral, acidic and basic fractions of cooking volatiles; non-volatile flavour compounds; cyclic compounds in cooking volatiles; sulphur compounds; and the compounds responsible for flavour. KAR
- 3490 FIELD (RA), WILLIAMS (JC) and MILLER (GJ). The effect of diet on lamb flavour. *Food Technol.* 37(5); 1983; 258-63

- 3491 CROUSE (JD). The effects of breed, sex, slaughter weight and age on lamb flavour. *Food Technol.* 37(5); 1983; 264-8

DEER

- 3492 BRITTIN (HC), ARMES (CL), RAMSEY (CB) and SIMPSON (CD). Palatability of meat from mule deer. *J. Food Sci.* 46(6); 1981; 1805-7, 1816

PORK

- 3493 REAGAN (JO). Optimal processing systems for hot-boned pork. *Food Technol.* 37(5); 1983; 79-80, 82-85, 104
- 3494 CHOBERT (JM), GOUTEFONGEA (R) and VALIN (C). Effect of presalting on solubility and extractibility of pork meat proteins. *Sci. Aliment.* 1(2); 1981; 187-202 (French)
- Quantitative and qualitative analyses - by polyacrylamide gel electrophoresis, in the presence of sodium dodecyl sulphate and 2-mercaptoethanol- of different protein fractions, extracted after either an extemporaneous pre-salting, or a 24- or 48-hour presalting of pork meat with 1, 2 and 3% NaCl show that it is advisable to presalt for a short period of time with 2 or 3% NaCl. The effect of pre-salting on the solubilization of myofibrillar proteins is more marked for fine-textured pork meat products (fresh sausage) than for coarse textured products (dry sausage, or "saucisson"). KMD
- 3495 TAYLOR (AA), SHAW (BG), JOLLEY (PD) and NUTE (GR). Hot curing Wiltshire bacon. *J. Food Technol.* 17(3); 1982; 339-48
- 3496 LEE (RY), SILVERMAN (GJ) and MUNSEY (DT). Growth and enterotoxin A production by *Staphylococcus aureus* in precooked bacon in the intermediate moisture range. *J. Food Sci.* 46(6); 1981; 1687-92, 1700
- 3497 WANSTEDT (KG), SEIDEMAN (SC), DONNELLY (LS) and QUENZER (NM). Sensory attributes of precooked, calcium alginate-coated pork patties. *J. Food Prot.* 44(10); 1981; 732-5
- Ground pork patties were prepared containing 37% fat and assigned to one of five treatments: (a) control; (b) precooked, no calcium alginate coating; (c) calcium alginate coated, no precooking; (d) calcium alginate coated before precooking and (e) calcium alginate coated after precooking. The calcium alginate coating significantly improved sensory attributes. Warmed over flavour (WOF) was eliminated in precooked, alginate coated patties as judged by sensory scores and TBA values. Coated patties with no precooking, and patties coated after precooking were found to be more desirable than control patties. AA
- 3498 DRERUP (DL), JUDGE (MD) and ABERLE (ED). Sensory properties and lipid oxidation in prerigor processed fresh pork sausage. *J. Food Sci.* 46(6); 1981; 1659-61

SWINE

- 3499 PARKS (OW). Screening test for sulphamethazine and sulphathiazole in swine liver. *J. Assoc. Off. Anal. Chem.* 65(3); 1982; 632-4

POULTRY

- 3500 KIRKPATRICK (HR). Innovations in food (Eggs and Poultry). *IFST Proc. Sci. Technol.* 15(3 Pt.1); 1982; 92-7
The innovations mainly cover those contemplated for North Ireland.
KAR
- 3501 CHEN (TC) and WAIMALEONGORA-EK (C). Effect of pH on TBA values of ground raw poultry meat. *J. Food Sci.* 46(6); 1981; 1946-7
- 3502 THOMAS (YO), LULVES (WJ) and KRAFT (AA). A convenient surface plate method for bacteriological examination of poultry. *J. Food Sci.* 46(6); 1981; 1951-2
- 3503 ERICSSON (B), HEGG (P-O) and MARTENSSON (K). Protection of ovalbumin against irreversible heat denaturation by a cationic amphiphile at high concentration. *J. Food Technol.* 18(1); 1983; 11-9

CHICKEN

- 3504 PRUSA (KJ), CHAMBERS (E), BOWERS (J-A), CUNNINGHAM (F) and DAYTON (AD). Thiamin content, texture, and sensory evaluation of postmortem papain-injected chicken. *J. Food Sci.* 46(6); 1981; 1684-6
- 3505 GRAY (JI), BUSSEY (DM), DAWSON (LE), PRICE (JF), STEVENSON (KE), OWENS (JL) and ROBACH (MC). Investigation into the formation of N-nitrosamines in heated chicken frankfurters. *J. Food Sci.* 46(6); 1981; 1817-9
- 3506 CUNNINGHAM (FE) and TIEDE (LM). Influence of batter viscosity on breading of chicken drumsticks. *J. Food Sci.* 46(6); 1981; 1950-52
- 3507 SUNDERMAN (DR) and CUNNINGHAM (FE). Effect of freezing broiler drumsticks on breading adhesion. *J. Food Sci.* 46(6); 1981; 1953,1955
- 3508 BLANKENSHIP (LC) and CRAVEN (SE). *Campylobacter jejuni* survival in chicken meat as a function of temperature. *Appl. Environ. Microbiol.* 44(1); 1982; 88-92

TURKEY

- 3509 FISHER (C) and SCOUGALL (RK). A note on the amino acid composition of the turkey. *Br. Poult. Sci.* 23(3); 1982; 233-7
- 3510 SALMON (RE), DUNKELGOD (KE) and WILSON (BJ). Influence of dietary protein concentration and frequency of diet changes on rate of growth, efficiency of food utilisation and carcass quality of large white turkeys. *Br. Poult. Sci.* 23(6); 1982; 501-17

EGG

- 3511 MACKENZIE (KA) and SKERMAN (VBD). Microbial spoilage in unpasteurised liquid whole egg. *Food Technol. Aust.* 34(11); 1982; 524-8
Bacteria (261 strains) were isolated from spoiled, unpasteurised, liquid whole egg using a micromanipulation technique. The strains were isolated at 30,25,20,10 and 5 C. Gram-negative bacteria were dominant at all temperatures. Members of the *Enterobacteriaceae* were predominant at 30-20 C, while members of the *Pseudomonadaeae* and *Vibrionaceae* were commonly isolated at 20 and 10 C. At 5 C *Pseudomonas* strains account for the majority of isolates. KAR
- 3512 GALYEAN (RD) and COTTERILL (OJ). Ion-exchange chromatographic determination of lysozyme in egg white. *J. Food Sci.* 46(6); 1981; 1827-8, 1834
- 3513 MATSUDA (T), WATANABE (K) and SATO (Y). Heat induced aggregation of egg white proteins as studied by vertical flatsheet polyacrylamide gel electrophoresis. *J. Food Sci.* 46(6); 1981; 1829-34
- 3514 SHERIDAN (AK), HUMPHRIS (CSM) and NICHOLLS (PJ). The cholesterol content of eggs produced by Australian egg-laying strains. *Br. Poult. Sci.* 23(6); 1982; 569-75
- 3515 OERTEL (ML) and HARTFIEL (W). Effects of oxidized fatty acids of mixed feed on interstitial carotinoids in egg yolk. *Fette Seifen Anstrichmittel.* 83(4); 1981; 139-43 (German)
It was the target of investigations to test whether a different degree or course of oxidation of the fat/oil contained in mixed feed influences the deposit of carotinoids in egg yolk. The results show a significant influence of fat oxidation on carotinoid deposition in egg yolk. The yolk colour decreases with increasing peroxide value and is improved at lower peroxide values. Especially oils with high contents of unsaturated fatty acids cause a diminished carotinoid deposition in egg yolk. By addition of antioxidants the fatty acid oxidation can be delayed. Basic feed components, among others had tapioca meal with high lipooxygenase activity, can have an important influence too on peroxide formation and with that on yolk colouring. AA
- 3516 BOSTEL (W). Egg determination with the AOAC-method-practical experiences from a routine laboratory. *Getreide-Mehl Brot.* 35(5); 1981; 113-5 (German)
The author concludes that the Acker-Greve method and the enzymatic method are in good agreement, except in the case of previously steamed paste goods. AOAC method always gives higher values for total sterols, because of the hydrolysis of phytosterol esters. But good agreement is obtained between these two methods, if the sample is dissolved in acid prior to the estimations. The AOAC method appears to have certain weaknesses in the case of paste goods containing 7-8 eggs/kg. The enzymatic method has not yet been perfected for pre-steamed paste goods. KMD
- 3517 TAYLOR (JE), IDERSTINE (AV), WEPPELMAN (RM), OLSEN (G), WALKER (RW), MERTEL (HE) and VANDENHEUVEL (WJA). Residues of the forced malting agent xylonidine in chicken egg yolk and albumen as determined by combined gas-liquid chromatography-mass spectrometry. *J. Agric. Food Chem.* 30(5); 1982; 858-61

SEAFOODS

FISH

- 3518 MATUSZEK (T). Effect of time and fish temperature on the blunting rate of filleting knives. *J. Food Process. Eng.* 5(4); 1982; 203-13
The blunting rate of the disc knives in the filleting process is influenced by the anatomical location of the cut, cutting time and temperature of the fish body. The head cutting, abdominal-bone cutting and spinal bone separating knives blunt faster due to the structural differentiation in the fish body. The longer cut at the spinal bone separation also increases the blunting rate. Lowering the fish temperature from 285 K to 258 K(+12 to -15 C) accelerated the blunting rate of the knives about 2.4 times. AA
- 3519 HOFFMANN (A). The use of the GR Torrymeter for the assessment of freshness of iced tropical fish from the Indian Ocean. *Trop. Sci.* 23(4); 1981; 283-91
The GR Torrymeter was used to assess the freshness of 10 species of marine fish stored under ice in the Seychelles. The values given by the meter correlated well with sensory assessments and total volatile base values. KMD
- 3520 SIKORSKI (Z) and KOSTUCH (S). Trimethylamine N-Oxide demethylase: Its occurrence, properties, and role in technological changes in frozen fish. *Food Chem.* 9(3); 1982; 213-22
Trimethylamine N-oxide (TMAO) which is found in sea fish is broken down to during post mortem to dimethylamine (DMA) and formaldehyde. (FA). Freezing and frozen storage do not destroy the activity of TMAO demethylase. The rate of enzymatic cleavage of TMAO to FA and DMA depends on the substrate and FA. KAR
- 3521 HOLAK (W). Determination of methylmercury in fish by high-performance liquid chromatography *Analyst.* 107(1281); 1982; 1457-61
- 3522 ICHINOTSUBO (DY) and MOWER (HP). Mutagens in dried/salted Hawaiian fish. *J. Agric. Food Chem.* 30(5); 1982; 937-9
- 3523 LANIER (TC), LIN (TS), HAMANN (DD) and THOMAS (FB). Effect of alkaline protease in minced fish on texture of heat processed gels. *J. Food Sci.* 46(6); 1981; 1643-5
- 3524 BORDERIAS (AJ), LAMUA (M) and TEJADA (M). Texture analysis of fish fill-ets and minced fish by both sensory and instrumental methods. *J. Food Technol.* 18(1); 1983; 85-95
In an attempt to establish objective criteria for texture analysis as an effective substitute for organoleptic procedures, correlation between the results obtained by a panel of tasters and physical and chemical analyses of texture was determined. In addition, regression equations relating instrumental and sensory methods were applied to predict sensory data from those obtained during instrumental analysis. AA
- 3525 KOIZUMI (C). Fish products in Japan. *Indian Food Ind.* 1(4); 1982; 129-37

Discusses: dried fish products; boiled-dried products; salted dried products; frozen dried products; dried fish sticks; salted fish and fish roe products; fish paste products; and canned products. BSN

- 3526 LEE (CM) and ABDOLLAHI (A). Effect of hardness of plastic fat in structure and material properties of fish protein gels. *J. Food Sci.* 46(6); 1981; 1755-9
- 3527 NIKI (H) and IGARASHI (S). Some factors in the production of active fish protein powder. *Bull. Jpn. Soc. Sci. Fish.* 48(8); 1982; 1133-7 (Japanese)
- Active Fish Protein Powder (AFPP) is the spray-dried fish meat powder that retains the functionality of fresh fish meat. In order to search the various factors that affect the activity of AFPP, the effects of additives, pH, ionic strength, the duration of washing of the raw fish meat, and the temperature of spray-drying were studied. A fresh fish meat of Alaska pollack was washed several times, milled with saccharide and other additives, and spray-dried. The activity of AFPP was measured by ATPase-activity and its Kamaboko-forming ability. Saccharide prevented the denaturation of fish meat protein during spray-drying. In order to produce the highly active AFPP, about 25% of saccharide must be added to fish meat, calculated by dry weight. The pH of fish meat was one of the most important factors in the producing of AFPP. The highly active AFPP was made from the fish meat of neutral pH and the less active AFPP was made from the fish meat of acidic and alkaline pH. The high ionic strength of fish meat decreased the activity of AFPP. The washing time of raw fish meat affected the quality of AFPP. The well-washed fish meat increased the activity and whiteness of AFPP. The inlet and outlet air temperature of spray-drying affected the activity of AFPP very much. AA
- 3528 SPARK (AA). Ethoxyquin in fish meal. *J. Am. Oil Chem. Soc.* 59(4); 1982; 185-8
- Four reliable methods are described for the determination of ethoxyquin antioxidant in fresh fish meal. These include an accurate chromatographic laboratory method, a colorimetric method, and 2 rapid factory methods, one a quantitative titration technique and the other suitable for spot checks for ethoxyquin in "go-no go" situations. With the laboratory method, 6 or 8 chromatographic columns can be handled simultaneously. The 2 rapid methods are based on 1,1-diphenyl-2-picrylhydrazyl and may be used routinely in the factory to determine the antioxidant content of several hundred samples. AA

SALMON

- 3529 STIER (RF), BELL (L), ITO (KA), SHAFER (BD), BROWN (LA), SEEGER (ML), ALLEN (BH), PORCUNA (MN) and LERKE (PA). Effect of modified atmosphere storage on *C. botulinum* toxigenesis and the spoilage microflora of salmon fillets. *J. Food Sci.* 46(6); 1981; 1639-42

CROAKER

- 3530 SU (H), LIN (TS) and LANIER (TC). Contribution of retained organ tissues to the alkaline protease content of mechanically separated Atlantic croaker (*Micropogon undulatus*). *J. Food Sci.* 46(6); 1981; 1650-53, 1658

- 3531 SU (H), LIN (TS) and LANIER (TC). Investigation into potential sources of heat stable alkaline protease in mechanically separated Atlantic croaker (*Micropogon undulatus*). *J. Food Sci.* 46(6); 1981; 1654-6, 1664

ANTARTIC KRILL

- 3532 WANKE (W), FLECHTENMACHER (W) and SCHREIBER (W). Spray-dried protein concentrate from Antarctic Krill. Part 2. Sensory, physical, and chemical evaluation. *Food Sci. + Technol.* 14(3); 1981; 141-9 (German)
- Protein concentrate was prepared from Antarctic krill (*Euphausia superba*), immediately after they were caught, in seven different ways. The suitability of the concentrate for use in food preparations was studied over a subsequent storage period of two years. The results of sensory, physical, and chemical tests have been correlated with method of processing, use of anti-oxidants and packaging. However, much work still remains to be done before a smooth and unproblematic procedure of manufacture and distribution can be established. KMD
- 3533 KIMOTO (K), THANH (VV) and MURAKAMI (K). Acid proteinases from Antarctic krill, *Euphausia superba*: Partial purification and some properties. *J. Food Sci.* 46(6); 1981; 1881-4

MACKEREL

- 3534 LEU (S-S), JHAVERI (SN), KARAKOLTSIDIS (PA) and CONSTANTINIDES (SM). Atlantic mackerel (*Scomber scombrus*, L): Seasonal variation in proximate composition and distribution of chemical nutrients. *J. Food Sci.* 46(6); 1981; 1635-8

GRAYFISH

- 3535 YANG (C-T), JHAVERI (SN) and CONSTANTINIDES (SM). Preservation of gray fish (*Squalus acanthias*) by salting. *J. Food Sci.* 46(6); 1981; 1646-9

WHITE FISH

- 3536 HAMILTON (M) and BENNETT (R). An investigation into consumer preferences for nine fresh white fish species and the sensory attributes which determine acceptability. *J. Food Technol.* 18(1); 1983; 75-84
- Nine fresh white fish species (cod, haddock, whiting, blue whiting, ling, saithe, lemon sole, plaice, dab) were investigated by sensory panels. Assessors could distinguish between species and although they would express relative preferences, they did not feel very strongly about them. Flavour was the most significant positive determinant of acceptability, texture was neutral and appearance was either neutral or negative. It is probable that most fresh white fish could be satisfactorily interchanged with one another without causing adverse consumer reaction. AA

SURIMI

- 3537 WATANABE (H), TAKAI (R) and HASEGAWA (H). Energy use in the manufacture of frozen surimi. *Bull. Jpn. Soc. Sci. Fish.* 48(7); 1982; 941-4 (Japanese).

The primary energy input to frozen surimi product was estimated to be 7.5 GJt⁻¹ surimi product; 36% of the energy is used in the surimi manufacturing process, 27% in the freezing process 21% in effluent treatment and 16% in packaging. The cost of additives was the predominant factor and was approximately 30% of the total cost. AA

SHELL FISH

- 3538 ANON. Viral infection spread by shellfish. *Environ. Health.* 89(10); 1981; 269

ABALONE

- 3539 WARNE (AD) and BROWN (N). The influence of thermal processing severity on the yield and texture of canned abalone (*Notohaliotis ruber*). *Food Technol. Aust.* 34(10); 1982; 448, 450-51

Cans of abalone were processed for 40 minutes at 115.6, 118.0 and 121.1 C respectively, and for 60 minutes at 121.1 C, after which the relationship between the process F value and pack weight was studied. Significant losses on canning, based on the ratios of drained to filled weight, and softening texture, assessed objectively with an Instron 1140 Food Testing Machine, were observed as thermal processing severity increased. KAR

PRAWN

- 3540 GOVINDAN (TK). Packagings for frozen prawn products: Part 1. Corrugated fibre-board master cartons. *Seafood Export J.* 14(8); 1982; 21-4

The author has explained some of the specifications of the Indian Standards Institution (ISI) for fibre-board master cartons used for packaging of frozen prawns. He has compared the requirements relating to material to be used; its bursting strength, water-proofness, and puncture resistance; weight of material per unit area; total weight of the carton; and the dimensions of the carton with the properties of cartons that are currently being manufactured. He concludes that the ISI specification is too stringent for the industry to comply with at present. KMD

- 3541 SUMMER (JL). The impact of hygiene standards on the international prawn trade. *Trop. Sci.* 23(4); 1981; 301-11

This study was carried out following the rejection of several prawn shipments, on hygienic grounds, in 1979. Malaysian prawns have often been rejected in the U.K., Australia, and New Zealand. However, tropical prawns were not implicated in the outbreaks of salmonellosis or staphylococcal food poisoning in the importing countries. Moreover, bacteriological standards for prawns vary widely between importing countries, and the author believes that the standards applied in Australia and New Zealand

are unrealistic, as they are very difficult to attain on a commercial scale. More uniform standards, based on the recommendations of the International Commission on Microbiological Specifications for Foods, should be formulated. KMD

CLAM

- 3542 SANTHANAKRISHNAN (G). Export of frozen clam meat; an achievement under diversification in developing from under utilised resource. *Seafood Export J.* 14(8); 1982; 19-20

At present, thousands of tons of oysters, mussels, and clams are caught in the coastal, estuarine, and back-waters of India only for their shells which are burnt to produce lime. The author describes a method for the depuration, (pre-processing), cooking, grading, processing, and packaging of clam meat. Frozen clam meat has a ready market in Japan, and perhaps also in France, Italy and the USA. KMD

SQUID

- 3543 SANTHANAKRISHNAN (G). Dried squid. Part II. A note on processing, packing and storing. *Seafood Export J.* 14(7); 1982; 9-13

Cleaning, sun-drying, packing, and frozen storage of squid and cuttle fish have been described. The products appear to be acceptable in the Hong Kong, Singapore, Hawaii and Japanese markets. KMD

SHRIMP

- 3544 RAMALINGAM (V). Recent trends in Japanese shrimp imports. *Seafood Export J.* 14(7); 1982; 17-25

Quarterly and half yearly imports of shrimp by Japan, exporting countries, and limitations to the growth of shrimp imports by Japan are the topics covered. KMD

- 3545 YOUNG (RH), DURAN (L) and VELEZ (JF). Effect of process variables on the characteristics of dried/salted fish minces prepared from Mexican shrimp by-catch. *Trop. Sci.* 23(4); 1981; 269-82

The optimal conditions for preparation of acceptable dried/salted minces from fish caught along with Mexican shrimps were: precooking of minces at 100 C for 1 hour followed by dehydration at 40 C to about 25% of the original weight. The process - which can also be carried out by employing solar energy only does not adversely affect the high quality of fish protein, although some reduction in net protein utilization (NPU) did occur after 6 months of storage at ambient temperature. KMD

PROTEIN FOODS

Nil

FRUIT JUICES AND BEVERAGES

- 3546 MANNINO (S). Determination of lead in fruit juices and soft drinks by potentiometric stripping analysis. *Analyst.* 107(1281); 1982; 1466-70

- 3547 BIELIG (HJ) and HOF SOMMER (HJ). Is there a 100% fruit juice? *Dtsch. Lebensmittel-Rundsch.* 77(9); 1981; 324-9 (German)

The West German fruit juice directive, issued in 1977, has sometimes given rise to considerable legal uncertainty as regards declaration. In particular, terms like "100% fruit juice content", "100% fruit content", and "made from concentrate" on the label have often been subjects of controversy. After explaining objectively measurable parameters, different manufacturing procedures, and legal aspects, the authors try to give a generally valid answer. They find that sub-division of the fruit juices into different categories is not possible, and that the statement "100% fruit content" for a fruit juice is not an advertisement with an obvious meaning. KMD

- 3548 TONOGAI (Y) and IWAIDA (M). Rapid determination of ortho- and polyphosphates in soft drinks. *J. Food Prot.* 44(11); 1981; 835-8

- 3549 GHERARDI (S) and VICINI (E). An investigation on the mould content of fruit nectars and tomato juices. *Ind. Conserv.* 56(4); 1981; 241-3 (Italian)

The results presented of an extensive investigation carried out from 1974 to 1980 on mould content (determined by the Howard method), pH value and total acidity of commercial pear, peach, apricot and apple nectars and tomato juices. The results reported show that the mould content of fruit nectars is generally lower than 10% positive fields, where as much higher values are found in tomato juices. AA

ORANGE

- 3550 SAURI (E), NADAL (I), ALBEROLA (J), SENDRA (JM) and IZQUIERDO (L). A rapid method for the quantitative analysis by gas chromatography of water soluble major volatile constituents of orange juice. *Rev. Agroquim. Tecnol. Aliment.* 21(2); 1981; 276-80

A rapid method for the quantitative determination by gas chromatography of water soluble major volatile (methanol, acetaldehyde and ethanol) contents in orange juice is described. The orange juice sample is directly injected in a chromatographic column packed with Porapak Q. Results show a good reproducibility and are similar to those obtained by chemical oxygen demand determination. However, the chromatographic method is faster and allows the quantitative analysis of every compound under study. AA

- 3551 DONER (LW) and BILLS (DD). Mass spectrometric $^{13}\text{C}/^{12}\text{C}$ determinations to detect high fructose corn syrup in orange juice. *J. Assoc. Off. Anal. Chem.* 65(3); 1982; 608-10

The $^{13}\text{C}/^{12}\text{C}$ ratios in orange juice are sufficiently uniform and different from those in high fructose corn syrup (HFCS) so that the addition of HFCS to orange juice can be detected. HFCS averages -9.7% (parts per thousand) $\delta^{13}\text{C}$, orange juice averages -24.5%, and mixtures of HFCS and

orange juice possess intermediate values. One pure orange juice and 4 orange juice-HFCS mixtures containing from 25 to 70% orange juice were properly classified by 7 collaborators. The $^{13}\text{C}/^{12}\text{C}$ mass spectrometric method was adopted official first action for detecting HFCS in orange juice. AA

TEA

3552 CLOUGHLEY (JB), ELLIS (RT), PENDLINGTON (S) and HUMPHREY (P). Volatile constituents of some central African black tea clones. *J. Agric. Food Chem.* 30(5); 1982; 842-5

3553 CHANG (SS) and GUDNASON (GV). Effect of addition of aluminium salts on the quality of black tea. *J. Agric. Food Chem.* 30(5); 1982; 940-43

Addition of an appropriate Al salt increases redness and brightness of extracts of black tea and also improves the taste. An extensive study was carried out to determine which tea constituents reacted with Al to improve tea colour. Extraction with solvents indicated that the theaflavins reacted with Al salt to form red complexes. Separations by Sephadex LH-20 chromatography and HPLC showed that at least two other tea polyphenols formed bright, deep yellow complexes with Al salt. Several other tea components also reacted slightly with Al salts to form yellow complexes. However, stoichiometrically most of the Al in tea is in the uncoloured forms. Al ions appeared to be unique among common cations in being capable of enhancing tea colour and flavour. AA

3554 CLOUGHLEY (JB). Factors influencing the caffeine content of black tea. Part 1. The effect of field variables. *Food Chem.* 9(4); 1982; 269-76

The caffeine content of made teas was influenced by seasonal, genetic, agronomic and cultural factors. The highest levels of caffeine were produced during the peak harvesting season when shoot growth rate was most rapid. Teas produced in the off-season contained about 50% less caffeine. The caffeine content of four clones varied by about 35% and varied in response to nitrogen fertiliser application, although, generally, caffeine levels increased with increasing N rate. The concentration of caffeine in the different shoot components varied markedly, being much higher in younger tissue and in leaf tissue than in stem tissue. A coarser plucking standard would result in a tea lower in caffeine content than tea produced from small shoots. AA

COFFEE

3555 WALKOWSKI (A). Changes of the quality determinants of coffee beans during storage. *Lebensmittelindustrie.* 28(2); 1981; 75-6 (German)

Changes in quality determinants, such as the chlorogenic acid and its isomers, the acidity of the beans, fat content, the activity of orthophenoloxidase and the chlorogenic acid - protein complex of coffee beans were studied during coffee bean storage. Considerable changes in the fat and protein fraction and the chlorogenic acid fraction were observed. Fat, protein and chlorogenic acid content recorded a decrease during storage. KMD

3556 ANON. Tests about shipping of raw coffee in containers. *Lebensmittel-Industrie.* 28(2); 1981; 76-77 (German)

Tests were conducted to examine the possibility of shipping raw coffee in cooling containers. Results showed that the deviations in final temperature and the temperature of air passed into the container are dependent on the temperature difference between external air and air inside the container. Owing to the sorption behaviour of the loading material, the value of the relative humidity did not exceed 80% at any of the measuring place. For transporting raw coffee in isolated containers, one should see to it that the water content of the load is below 12%. During the cooling of the injected air, its relative humidity increases. So long as this value is higher than the balanced humidity above or in the load, the coffee takes up moisture from the air through sorption and increases its water content. VR

- 3557 KING (BM) and SOLMS (J). Interactions of volatile flavour compounds with propyl gallate and other phenols as compared with caffeine. *J. Agric. Food Chem.* 30(5); 1982; 838-40

In order to understand the partitioning of flavours that occurs during both food processing and food consumption, we determined the air-water partition coefficients for several volatile flavour compounds by means of GC. In this way, it was shown that the aqueous solubility of anisole, 2,3-diethylpyrazine, and ethyl benzoate increased in solutions containing propyl gallate or other phenols such as chlorogenic acid or naringin. The phenol-induced solubilization of flavour compounds was compared to a similar effect induced by caffeine in systems where the formation of a molecular complex between caffeine and the flavour compound is possible. Partition coefficients are also given for systems containing both a phenol and caffeine. AA

COCOA

- 3558 GEILINGER (I), AMADO (R) and NEUKOM (H). Isolation and characterization of native starch from cocoa beans. *Starch.* 33(3); 1981; 76-9

This paper describes the isolation and characterization of native starch from fermented cocoa beans. The isolation procedure is based mainly on the mild extraction of compounds soluble in different extractants and flocculation of non-starch polymeric material at a pH of 2.7. The isolated eggshaped starch granules have a mean size of 4.4 μm , ranging from 1.5 to 8 μm , an amylose content of 30.4%, gelatinization temperatures from 52.5 to 68 C and a limiting viscosity number of 166.2 ml/g in 1-N potassium hydroxide solution. AA

- 3559 DeVRIES (JW), JOHNSON (KD) and HEROFF (JC). HPLC determination of caffeine and theobromine content of various natural and red dutched cocoas. *J. Food Sci.* 46(6); 1981; 1968-9

WINE

- 3560 ALVAREZ-NAZARIO (F). Evaluation of tabarie's formula. *J. Assoc. Off. Anal. Chem.* 65(3); 1982; 765-7

A strict derivation of an empirical formula, long used in the wine industry for the determination of extract, shows its inherent limitations. AA

- 3561 McCALLUM (NK) and MUIRHEAD (JM). Gas chromatographic determination of propane-1,2-diol in flavour bases, flavoured and natural wines. *Food Technol. NZ.* 17(8); 1982; 34-5
A method for the quantification of propane-1,2-diol in wine by gas chromatograph is presented. Detection limits for this analysis are less than 0.001% and the natural wines analysed usually had levels approaching this (less than 0.003%). AA
- BEER
- 3562 MUELLER (G). Preparation and processing of brewery yeast sludge using high-pressure chamber-filter presses. *MBAA Techn. Quart.* 19(2); 1982; 57-62
- 3563 PALMER (GH). A reassessment of the pattern of endosperm hydrolysis (modification) in germinated barley. *J. Inst. Brew.* 88(3); 1982; 145-53
- 3564 NOUT (MJR) and DAVIES (BJ). Malting characteristics of finger millet, sorghum and barley. *J. Inst. Brew.* 88(3); 1982; 157-63
The malting characteristics of the finger millet variety Imele (FI), sorghum varieties Andivo (SA) and Ingumba (SI) and the barley variety Research (BR) were compared in relation to the brewing of traditional African opaque beer as well as conventional lager beer. The investigations include (a) the effect of steeping and germination conditions, (b) the influence of gibberellic acid and kilning temperature on the activity of important brewing enzymes and (c) an appraisal of the brewing potential of the worts obtained. FI, SA and SI malts were considered unsuitable as barley malt extenders for conventional lager beers, but FI and possibly SI malts would be suitable for tropical lager beer manufacture. AA
- 3565 BORKMANN (K), SENGE (I), HOFFMANN (H) and WILKE (J). Large scale outdoor fermenters for fermentation and maturing of beer. 3. Measuring of the flow speed in a fermenter with a volume of 250 m³. *Lebensmittelindustrie.* 28(2); 1981; 62-7 (German)
Continuing the articles about the introduction of large scale outdoor fermenters for fermentation and maturing of beer, which were published in 1975 and 1976 1,2,3, this contribution deals with the flow processes in the fermenter. Measurement of the flowspeed in axial and radial direction in the beer fermenter with a volume of 250 m³ made is possible to detect the motion processes to optimize the technological scheme especially in the phase of the final fermentation. The flow is three dimensional, non-stationary, and random, and is characterized by pulse like flowing up of the mixture of phases, and by a great number of whirls. The flow speeds are of the order of about 10⁻¹ m/s. AA
- 3566 KELSALL (D). The brewmaster and his computer in the brewhouse. *MBAA Techn. Quart.* 19(2); 1982; 68-70
- 3567 EDER (LJ). Reduction of operating costs through effluent pretreatment. *MBAA Techn. Quart.* 19(3); 1982; 111-4, 138
- 3568 SIVAK (RF). Noise control design for packaging. *MBAA Techn. Quart.* 19(3); 1982; 115-21

- 3569 KEMPER (EA). A convenient method for evaluating tank lining resins systems. *MBAA Techn. Quart.* 19(3); 1982; 122-3
- 3570 DRAPER (WM), LUCERO (CM) and STREET (JC). Determination of carbofuran's phenolic metabolites in hops. *J. Agric. Food Chem.* 30(5); 1982; 1002-4
- 3571 FRENCH (BJ), RIPLEY (BD) and EDGINGTON (LV). The occurrence of dimethylamine in malt. *MBAA Techn. Quart.* 19(2); 1982; 53-6
- 3572 OLSON (WJ). Control of malt N-nitrosodimethylamine in direct kilning without use of sulphur oxides. *MBAA Techn. Quart.* 19(2); 1982; 63-7
- 3573 NARUMI (K-I) and MURAKAMI (M). Suntory's modern automated brewery. *MBAA Techn. Quart.* 19(3); 1982; 124-35
- 3574 MORRISON (GR). Flavour thresholds for added substances. *J. Inst. Brew.* 88(3); 1982; 167-9
- 3575 MORRISON (GR). Measurement of flavour thresholds. *J. Inst. Brew.* 88(3); 1982; 170-74
- 3576 BUCKEE (GK), MALCOLM (PT) and PEPPARD (TL). Evolution of volatile compounds during wort-boiling. *J. Inst. Brew.* 88(3); 1982; 175-81
- 3577 WEINER (JP). Determination of lead in beer. *J. Inst. Brew.* 88(3); 1982; 154-6

Three procedures for the determination of low levels of lead in beer were evaluated and compared. The methods were (1) the existing IOB recommended procedure, (2) a dry ashing/AAS procedure and (3) a mixed solvent (xylene/2-heptanone) extraction of the DDDC complex. All three methods gave satisfactory results. AA

- 3578 BANCHS (NM) and ITRIAGO (MI). Influence of artificial light on the physico-chemical condition and flavour of beer. *MBAA Techn. Quart.* 19(2); 1982; 85-90
- 3579 CUTAIA (AJ). Malt beverages and brewing materials; Screening and confirmatory methods for nitrosamines in beer. *J. Assoc. Off. Anal. Chem.* 65(3); 1982; 584-7
- 3580 SEN (NP), SEAMAN (S) and BICKIS (M). Gas-liquid chromatographic thermal energy analyzer determination of N-nitrosodimethylamine in beer. *J. Assoc. Off. Anal. Chem.* 65(3); 1982; 720-29

The GLC/TEA method for N-nitrosodimethylamine (NDMA) in beer was studied collaboratively by 13 laboratories from 7 countries, employing different samples, a naturally contaminated commercial beer; a beer extremely low (ca 0.1 ppb) in NDMA; and the low NDMA beer spiked with 0.5, 1.9, and 5.0 ppb NDMA. The pooled repeatability and reproducibility coefficients of variations (CV) for all samples were 17% and 27%, respectively. However, when data from 2 laboratories (outliers) were omitted, the corresponding CV values improved considerably (11% and 15%, respectively). Variance analysis showed the presence of a significant laboratory-sample interaction when all data were used for analysis, but this interaction disappeared when data from the 2 outlying laboratories were excluded. The pooled percent recovery of the overall method (omitting outliers)

was 101.4 ± 3.5 . All the laboratories detected NDMA in the low NDMA beer. The method was adopted official first action. AA

BRANDY

- 3581 WENCKER (D), LOUIS (M), LAUGEL (P) and HASSELMANN (M). Attempts to identify fruit brandies on the basis of their higher alcohol and methanol contents. *Dtsch. Lebensmittel-Rundsch.* 77(7); 1981; 237-8 (German)
- 229 samples of six different fruit brandies (cherry, plum, mirabelle plum, Williams-Christ pear, raspberry, and more of spiced traminer) were analyzed for (i) total esters, (ii) total aldehydes, (iii) butanol-2, (iv) 2-methyl propanol-1, (v) butanol-1, (vi) 2- and 3-methylbutanol 1, (vii) sum of the higher alcohols, and (viii) methanol. The results of analysis for butanol-1 fall in six different clusters for the different brandies, with very little overlapping of the clusters. Another method of analysis would enable one to distinguish between cherry brandy, raspberry brandy, and more of spiced traminer, all of which have a butanol-1 content of less than 5 g/hl r.A.; a third method can distinguish between plum, Williams-Christ pear, and mirabelle plum brandies all of which have more than 10 g/hl r.A. of butanol-1. KMD

OILS AND FATS

- 3582 VAN OOSTEN (CW), POOT (C) and HENSEN (AC). The precision of the swift stability test. *Fette Seifen Anstrichmittel.* 83(4); 1981; 133-5
- The precision of the automated version of the oxidation stability test on oils and fats was investigated. Nine laboratories were involved in this ring test for testing 5 different oil and fat samples of the same origin according to a standard procedure. A standard graphical interpretation of the results was developed, resulting in a strict definition of the induction period. Its repeatability equals 0.99 h and the within-laboratory standard deviation is 1.45 h. AA
- 3583 DIJKSTRA (AJ) and MEERT (D). Determination of trace elements in oils by plasma emission spectroscopy. *J. Am. Oil Chem. Soc.* 59(4); 1982; 199-204
- An analytical method for the determination of phosphorus and other elements at low concentrations in edible oils has been developed using a plasma emission spectrometer. The method is fast because it eliminates the ashing process in sampling preparation and because the actual measurement takes less than 1 minute. Reproducibility and accuracy of the measurement are good and very low detection limits have been observed, e.g., 0.5 ppm for phosphorus and 5 ppb for copper. However, the long-term stability of the instrument cannot as yet be guaranteed and a procedure that prescribes regular measurement of samples of known concentration is essential as a means of detecting any drift in the output signal. AA
- 3584 MADISON (BL), DEPALMA (RA) and D'ALONZO (RP). Accurate determination of *trans* isomers in shortenings and edible oils by infrared spectrophotometry. *J. Am. Oil Chem. Soc.* 59(4); 1982; 178-81
- A procedure is described for the accurate analysis of the *trans* content of fats and oils in the range of 0.5-36% *trans*. This procedure is

shown to be more accurate than other current infrared spectrophotometry methods. This increased accuracy is obtained by using a 2-component calibration standard mixture and measuring the samples as methyl esters. Good agreement between this method and the measurement of *trans* content by a gas chromatography procedure is demonstrated. AA

- 3585 TOTANI (Y), PRETORIUS (HE) and duPLESSIS (LM). Extraction of phospholipids from plant oils and colorimetric determination of total phosphorus. *J. Am. Oil Chem. Soc.* 59(4); 1982; 162-3

A rapid extraction procedure to isolate phospholipids from plant oils is described. Glacial acetic acid is used as solvent and the extracted phospholipids are quantified by means of a colorimetric method. AA

- 3586 Survey by a working party of the DGF, 77th Report: Deodorisation and distillative neutralisation of edible fats and oils. I. *Fette Seifen Anstrichmittel*. 83(3); 1981; 89-97 (German)

Soon after the introduction of the first vaporisation process in the last decades of the nineteenth century, it was found that even free fatty acids, besides aroma substances, could be separated by treating crude or refined oils with steam. This led to the development of numerous processes for distillative neutralisation (deacidification), which, besides deodorisation, have been described in this report. VR

- 3587 KETOLA (MR). Chlorinated long chain fatty acids: Their properties and reactions XI: Kinetics and mechanisms of base catalysed dehydrochlorination of sodium 9,10,12,13,15,16-hexachlorooctadecanoate. *Fette Seifen Anstrichmittel*. 83(3); 1981; 106-13

- 3588 KARABON (B). Properties and application feasibilities of Montan resin. *Fette Seifen Anstrichmittel*. 83(3); 1981; 113-22 (German)

- 3589 SCHIRMACHER (W) and BISCHOFF (E). Molecular weight determination of high-melting, oxidized polyethylene waxes by vapour pressure osmometry. *Fette Seifen Anstrichmittel*. 83(4); 1981; 147-52 (German)

- 3590 MERRITT (C) Jr. and VAJDI (V). Identification of radiation-induced triglyceride adducts by mass spectrometry. *J. Am. Oil Chem. Soc.* 59(4); 1982; 172-7

- 3591 GARTI (N), WELLNER (E) and SARIG (S). Crystal structure modifications of tristearin by food emulsifiers. *J. Am. Oil Chem. Soc.* 59(4); 1982; 181-5

- 3592 EVANS (WJ), McCOURTNEY (EJ) and SHRAGER (RI). Titration studies of phytic acid. *J. Am. Oil Chem. Soc.* 59(4); 1982; 189-91

The 12 pKa values for phytic acid have been obtained from pH titration data and nonlinear regression analysis. The pKa values ranged from 1.9 to 9.5. The results are discussed in terms of previously determined pKa values. Possible reasons are given for the differences between previously determined values and present values. AA

- 3593 MIN (DB) and TICKNER (DB). Preliminary gas chromatographic analysis of flavour compounds in mayonnaise. *J. Am. Oil Chem. Soc.* 59(5); 1982; 226-8

The flavour compounds in fresh, 3- and 6-month-old mayonnaise at

room temperature have been analyzed by a gas chromatographic method. The results indicate that as the storage time of mayonnaise increased, the flavour compounds formed from oil in mayonnaise increased. However, the concentrations of allyl isothiocyanate which is the major flavour compound of mustard, and acetic acid and ethyl acetate which are the major compounds in vinegar did not change during the 6 months storage at room temperature. The analytical method described has shown good reproducibility in the analysis of mayonnaise flavour compounds and can be used as an instrumental analytical method to evaluate the mayonnaise flavour quality and to complement the sensory evaluation of mayonnaise. AA

SPICES AND CONDIMENTS

- 3594 ZURCHER (K) and HADORN (H). Equilibrium relative humidity and volatile oil content of commercial spices. Statistical evaluation of the analyses of ca. 750 spices. *Dtsch. Lebensmittel-Rundsch.* 77(7); 1981; 239-45 (German)

750 samples of spices were analyzed for equilibrium relative humidity and volatile oil content, over a period of 5 years. The results have been analyzed statistically, and are displayed as histograms in this paper. The equilibrium relative humidity in many samples was over 65%, and this led to moulding. The essential oil contents have been tabulated and compared with the specifications indicated in the 4th and 5th editions of the Swiss foodstuff book (*Lebensmittelbuch*). For some spices (caraway seeds, nutmeg, and cinnamon), the minimum essential oil content specified in the 5th edition is definitely too high and unrealistic. Some new limits have been provisionally suggested. KMD

GINGER

- 3595 GOVINDARAJAN (VS). Ginger - Chemistry, technology and quality evaluation: Part 1. *CRC Crit. Rev. Food Sci. Nutr.* 17(1); 1982; 1-96

Discusses: origin and habitat; botanical description; cultivation; harvesting; diseases and pests; yield; crop improvement; preparation for the market; recent developments in curing; structure and composition; microbiological contamination, insect infestation and their control; packaging; storage and transportation of whole ginger; adulteration and its detection; production, consumption, and trade in ginger; processed products (whole dried ginger, sliced and ground ginger; ginger beer; ginger ale; preserved ginger; crystallized ginger; ginger oil; ginger oleoresin); chemistry of ginger volatile oil; and chemistry of pungency stimuli compounds of ginger. BSN

PEPPER

- 3596 MATHAI (CK). Chemical quality of the 'Agmark' grades of black pepper berries. *Qualitas Plantarum.* 30(3/4); 1981; 195-8

Fifteen export grades (Agmark) of Indian black pepper have been studied for their chemical quality. The most popular grades MG I and II are quite rich in flavour components and medium in starch, whereas the heaviest and largest (TGEB) are rich in starch and medium in flavour components.

The lightest (Pinheads) are rich in per cent piperine and poor in aroma and starch. Weight of berries does not appear to be directly related to flavour characteristics. AA

- 3597 MATHAI (CK), KUMARAN (PM) and CHANDY (KC). Evaluation of commercially important chemical constituents in wild black pepper types. *Qualitas Plantarum*. 30(3/4); 1981; 199-202

Matured black pepper berries from 8 wild types, on chemical screening, showed wide variations in commercially important constituents. The results have been compared with those of the cultivated varieties. The possibility of exploitation of this information in black pepper quality improvement programmes is discussed. AA

PIMENTO

- 3598 GIMENEZ (JL), ROMOJARO (F) and BANET (E). Residues of organochlorine pesticides in pimentos (*Capsicum annuum* L.) meant for manufacture of red chilli powder. *Rev. Agroquim. Tecnol. Aliment.* 21(2); 1981; 240-46 (Spanish)

Residues of HCH, Lindane, aldrin, heptachlor + hep. epoxide, DDE, dieldrin, DDT, TDE, endrin, and toxaphene in green and ripe chillies (pimento fruits) grown in 7 regions of Spain have been estimated, as also residue of these compounds in the soil of these regions. KMD

- 3599 GIMENEZ (JL), ROMOJARO (F) and BANET (E). Organochlorine pesticides in red peppers (*Capsicum annuum* L.). *Rev. Agroquim Tecnol. Aliment.* 21(2); 1981; 241-6 (Spanish)

Chlorinated pesticide residues due to direct phytosanitary treatments or to plant absorption from contaminated soils were identified and quantified in samples of red peppers (*Capsicum annuum* L.) grown in the main production areas of the South East of Spain. In most contaminated areas, levels of pesticides in soils were also quantified. AA

DILL

- 3600 SCHREIER (P), DRAWERT (F) and HEINDZE (I). The quantitative composition of natural and technologically changed, aromas of plants. VIII. Volatile constituents of fresh dill herb, *Anethum graveolens*, L (Umbelliferae). *Food Sci. + Technol.* 14(3); 1981; 150-2

The volatile constituents of fresh Dill herb, *Anethum graveolens* L. were separated from a methanolic extract by liquid-liquid extraction. After liquid-solid chromatographic prefractionation on silica gel the volatile substances were identified by coupled gas chromatography-mass spectrometry and quantitatively determined by gas chromatography. 3,9-epoxi-p-menth-1-ene, α -phellandrene, α -terpinene, β -phellandrene, apiol as well as myristicine were found to be the quantitatively main constituents among totally 90 identified and determined volatile compounds. AA

CARDAMOM

- 3601 GOVINDARAJAN (VS), SHANTHI NARASIMHAN, RAGHUVeer (KG) and LEWIS (YS). Cardamom - Production, technology, chemistry and quality. *CRC Crit. Rev. Food Sci. Nutr.* 16(3); 1982; 229-326

Discusses: origin and habitat; botanical description and varieties; true cardamom; cultivation; pests and diseases; yield; cardamom in Guatemala, Sri Lanka, Tanzania; preparation for primary market (harvesting, sundrying, artificial drying, bleached cardamoms, seeds, by products); structure and composition; microbial contamination, insect infestation and their control, packaging, storage and transport; adulteration and its detection. Standards and grade specifications; production, consumption and trade; processed products (ground cardamom, cardamom volatile oil, oleoresin and extract); chemistry of volatile oil of cardamom; evaluation of flavour quality; cardamom in foods and beverages; and spices from allied species. BSN

OLIVE

- 3602 MARZOUK (B) and CHERIF (A). Lipogenesis in the olive. II. Formation of polar lipids. *Oleagineux*. 36(7); 1981; 387-91 (French)

Polar lipids account for 2.5% of the total lipids in olives; they consist of phospholipids (58%) and galactolipids (42%). While newly formed olive fruits contain 0.5 mg of polar lipids, the completely ripe olives contain about 4.5 mg each. Oleic acid is the characteristic component of the phospholipids, and linoleic acid of the galactolipids. As for neutral lipids, the accumulation of polar lipids also follows a sigmoidal curve. KMD

- 3603 PELAGATTI (O) and BRIGHIGNA (A). The revival and use of lactic acid bacteria for preparation of table olives by the "Sivigliano" system. *Ind. Aliment.* 20(181); 1981; 182-4 (Italian)

In order to promote the use, by the food industry, of table olives prepared by the Sivigliano system - i.e. by a spray technique using dried lactic ferments - the authors worked out a method of revitalizing, or reviving, the said ferments which method could be easily applied by the industry. The composition of the revitalizing agent used as: NaCl 8.5 g; glucose 10.0 g; yeast extract 3.0 g; distilled water 1000 ml; pH of the medium 6.4. KMD

FENUGREEK

- 3604 EL-MAHDY (AR) and EL-SEBAIY (LA). Changes in phytate and minerals during germination and cooking of fenugreek seeds. *Food Chem.* 9(3); 1982; 149-58

After 96 hours of germination, the dry weight of fenugreek seeds decreased while total ash increased. It is observed that during germination the phytic acid values decrease and the water soluble inorganic phosphorous values increase. Phytase activity which is absent in the ungerminated seeds originates after germination and the phosphorus activity is increased in the germinated seeds. Heat treatment practised in cooking and roasting fenugreek seeds has less effect on phytate elimination than does germination. Changes in calcium, magnesium, iron, manganese, copper and zinc are found to be dependent on the loss of dry weight which occurs during processing of fenugreek seeds. KAR

SENSORY EVALUATION

- 3605 McBRIDE (RL). Range bias in sensory evaluation. *J. Food Technol.* 17(3); 1982; 405-10

- 3606 CHAMBERS (E), BOWERS (JA) and DAYTON (AD). Statistical designs and panel training/experience for sensory analysis. *J. Food Sci.* 46(6); 1981; 1902-6

Samples from six experimental treatments (in a factorial arrangement) were presented to a three-member, trained-experienced panel and an eight-member semi-trained panel in either a randomized complete block (RCB) design or a balanced incomplete block (BIB) design. The experiment was repeated three times using chicken, turkey, and poultry frankfurters representing three levels of variation in experimental units. Flavour and textural characteristics were evaluated. Neither design was consistently more advantageous than the other; however, residual error mean squares for textural characteristics scored by the trained-experienced panel were lower for the BIB design. The three-member, trained-experienced panel had lower residual error mean squares than did the semi-trained panel. AA

- 3607 LIST (D) and EMSCHERMANN (B). Correlation between sensorily and instrumentally determined texture data in selected foodstuffs. *Gordian.* 81(9); 1981; 189-93 (German)

The texture, as one of the excellent sensory properties of foods, is becoming increasingly significant for the evaluation of foods. By calculating the correlation coefficients, the degree of the agreement of instrumentally and sensorily determined texture data can be determined. This implies a careful selection of the measuring and testing methods, depending on the food, and on the objective of the investigation. The results obtained sensorily and those obtained with the help of an Instron Food testing machine have been discussed taking the optimization of harvesting time point of leguminosae and of the tenderness range of carrots, potatoes, paste articles and beef as examples. VR

- 3608 DICKIE (AM) and KOKINI (JL). On the use of the Bird-Leider equation in food rheology. *J. Food Process. Eng.* 5(3); 1982; 157-74

Shear stress development at inception of a constant shear rate was studied for marshmallow cream, peanut butter, squeeze margarine, tub margarine, whipped butter, whipped cream cheese and whipped dessert topping using the cone and plate geometry of the Rheometrics Mechanical Spectrometer. For most foods studied transient shear stresses showed increasing shear stress overshoots with increasing shear rate. At the highest shear rate of 100 s^{-1} , transient stresses were as large as 425% of the steady state shear stresses, with the actual magnitude of overshoot depending on the particular food investigated. The Bird-Leider equation was chosen to model this time dependent flow behaviour by incorporating both steady viscous and elastic properties of the foods. By assuming that the viscosity function and primary normal stress coefficient followed power-law behaviour, and constructing a time constant from the calculated parameters, the Bird-Leider model provided a good prediction of maximum and steady state stresses as well as the time at which they occur, but only a crude prediction of shear stress decay. The model supplied two more empirical constants "a" and "b" where "a" can be regarded as a pseudo-elastic modulus. Variation in "a" with shear rate shows that all materials studied are nonlinear viscoelastic. AA

- 3609 BIRCH (GG), O'DONNELL (K) and MUSGRAVE (R). Intensity/Time studies of sweetness: Psychophysical evidence for localised concentration of stimulus. *Food Chem.* 9(3); 1982; 223-37

Salivary glucose concentrations, following tasting of a 10 ml glucose solution, declined to sub-threshold levels sooner than the elicited persistence of sweetness response. Thus persistence cannot be explained by residual stimulus in the oral fluid. Panellists experience 'saturation of sweetness intensity' at lower concentrations of sugar than those which cause 'saturation of persistence', which suggests that separate mechanisms are responsible for the intensity and persistence effects. Increases of volume from 10^{-2} ml to 1 ml of tasted solution, as well as increases of concentration, cause elevation of both intensity and persistence of sweetness although volume change does not affect intensity of response at low concentrations. These observations can be explained by assuming that the persistence of sweetness response is caused by localised concentrations of stimulus at or near the receptor which intensity is governed by the accessibility of receptors to stimuli at these sites. AA

FOOD STORAGE

- 3610 SEARLE (G) and CROZIER (RJ). Low temperature food storage: An investigation in large hotels in the city of Westminster. *Environ. Health.* 89(8); 1981; 212-3
- 3611 MCGINN (CJP). Evaluation of shelf life. *IFST Proc.* 15(3.Pt.2); 1982; 153-61

INFESTATION CONTROL AND PESTICIDES

- 3612 BOND (EJ) and DUMAS (T). A portable gas chromatography for macro- and microdetermination of fumigants in the field. *J. Agric. Food Chem.* 30(5); 1982; 986-8

A sensitive portable gas chromatograph, the Photovac 10A10, designed to analyze air samples for contaminants in the 0.001-100-ppm range was tested and found to be very suitable for analyzing fumigants, both at the low levels of concern for human health and at higher levels needed for pest control. By use of a Teflon column packed with carbopack BHT, the conditions for analyzing phosphine, methyl bromide, and ethylene oxide at concentrations below 0.1 ppm were established. From the standpoint of precision, versatility, and ease of operation the instrument gave consistent and reliable data, even at very low concentrations. AA

- 3613 LEESCH (JG) and HIGHLAND (HA). Phosphine and methyl bromide permeation of fabric and multiwall paper bags. *J. Econ. Entomol.* 75(5); 1982; 819-21

Woven polypropylene, burlap, and multiwall-laminate, insect-resistant treated (IRT) bags filled with flour were fumigated with phosphine and methyl bromide to determine the permeability of the bags to each fumigant. Results show that penetration of the IRT bags by both fumigants was significantly slower ($P < 0.05$) than penetration of the woven polypropylene or

burlap bags. Subsequently, both fumigants were held longer once they were inside the IRT bags; thus, more time may be required for dissipation of the fumigants from these bags after the treatment is terminated. AA

- 3614 CHAMBERS (JE), CASE (RS), ALLEY (EG) and YARBROUGH (JD). Short-term fate of mirex and 2,8-dihydromirex in rats. *J. Agric. Food Chem.* 30(5); 1982; 878-82

- 3615 ELLEN (H). Assessment of longitudinal distribution by granular pesticide applicators. *J. Agric. Eng. Res.* 27(5); 1982; 397-413

An electronic measuring device, which was developed to measure the longitudinal distribution pattern achieved by granular pesticide applicators, is described. Experiments were carried out to assess the distribution pattern of 3 different types of granule applicator, and the accuracy of distribution of 3 different types of granular pesticide. The influence of distribution on pest-control was also examined. For 2 types of granule applicator a higher distribution rate resulted in a more accurate distribution, whereas a higher forward speed resulted in a poorer distribution. For one distributor the accuracy of distribution was adequate only at a high rotational speed of the metering rotor. The accuracy of distribution of granules partly depends on the physical properties of the granules. The influence of distribution on pest control depends largely on the climatological conditions shortly before and after planting. AA

- 3616 EGLI (H). Storage stability of pesticide residues. *J. Agric. Food Chem.* 30(5); 1982; 861-6

- 3617 BUSH (B), CONNOR (S) and SNOW (J). Glass capillary gas chromatography for sensitive, accurate polychlorinated biphenyl analysis. *J. Assoc. Off. Anal. Chem.* 65(3); 1982; 555-66

A simple method is described for preparing Apiezon L-coated glass capillary columns for polychlorinated biphenyl (PCB) analysis. The mass represented by each of 72 chromatographic peaks separated on this column from a mixture of Aroclors 1221, 1016, 1254, and 1260 was determined; the mixture could then be used as a universally applicable calibration standard for analysis of environmentally modified polychlorinated biphenyl mixtures at the parts per billion (mg/g) level. Analytical sensitivity is <10 ng/mL for total PCBs and < 0.1 ng/mL for individual PCB congeners. AA

- 3618 WALISZEWSKI (SM) and SZYMCZYNSKI (GA). Simple, low-cost method for determination of selected chlorinated pesticides in fat samples. *J. Assoc. Off. Anal. Chem.* 65(3); 1982; 677-9

Pesticide residues are extracted with petroleum ether and separated from fat with concentrated H_2SO_4 instead of the commonly used adsorbents Florisil, alumina, or silica gel. Residues were analyzed by gas chromatography with electron capture detection. Recoveries of fortified samples were approximately 100%. AA

BIOCHEMISTRY AND NUTRITION

- 3619 OMAYE (ST), CHOW (FI) and BETSCHART (AA). *In vitro* interaction of 1- ^{14}C -ascorbic acid and 2- ^{14}C -thiamine with dietary fiber. *Cereal Chem.* 59(5); 1982; 440-43

- 3620 NOJEIM (SJ) and CLYDESDALE (FM). Dissolved oxygen concentration and iron valence in a model system. *J. Food Prot.* 44(10); 1981; 762-4
The effect of dissolved oxygen concentration on the ionization and valence of four food grade iron compounds was investigated. Nitrogen and oxygen gases were bubbled in varying ratios into potassium biphthalate buffers, pH 4.2, until the desired level of oxygen ($<1,6$ or $12 \mu\text{g/ml}$) was reached. The iron compounds were added, then analyzed for total ionic iron and ferrous ion concentrations after 2, 7, 14, 21 and 28 days. This model system showed that the concentration of dissolved oxygen had no significant effect on the percentage of added iron that became ionized or the percentage of iron present in the ferrous state. AA
- 3621 TOLSTOGUZOV (VB), BRAUDO (EF) and GUROV (AN). On protein functional properties and the methods of their control. Part I. On the concept of protein functional properties. *Nahrung.* 25(3); 1981; 231-9
In the present review the functional properties of proteins (PFP) are discussed from the stand point of the clarification of protein processing techniques suggested by the authors. The PFP concept is clarified on the basis of model systems. The results of the studies developed at the USSR Academy of Sciences, Institute of Organoelement Compounds have been used for discussion. AA
- 3622 GAUCHER-CHOQUETTE (J) and BOULET (M). Effect of alkali treatment on viscosity and on the sulphydryl and disulphide content of proteins. *Cereal Chem.* 59(5); 1982; 435-9
- 3623 ARNTFIELD (SD) and MURRAY (ED). The influence of processing parameters on food protein functionality. I. Differential scanning calorimetry as an indicator of protein denaturation. *Can. Inst. Food Sci. Technol. J.* 14(4); 1981; 289-94
- 3624 SANTORO (MIRM), MAGALHAES (JF) and HACKMANN (ERM). Simultaneous determination of vitamins A and D in dosage forms by high pressure liquid chromatography. *J. Assoc. Off. Anal. Chem.* 65(3); 1982; 619-23
Vitamins A and D were determined simultaneously in oily solutions, ointments, and elixiers, but only vitamin A could be determined in capsules. Samples were saponified with KOH in isopropanol-water, using hydroquinone as antioxidant, and extracted with ether-petroleum ether (1+1). After evaporation of solvent, residues were dissolved in isopropanol. Vitamins in these solutions were determined by reverse phase high pressure liquid chromatography, using methanol-water as mobile phase and detection at 254 nm. The reproducibility, using external standards, was 1.6-2.5% and 1.2-3.8% for vitamins A and D, respectively. AA
- 3625 MARTIN (CRA). Obesity. An invitation to disease. *Br. Food J.* 84(911); 1982; 176-8

TOXICOLOGY AND HYGIENE

- 3626 HOBBS (BC). Observation on public health microbiology including experience in India. *Food Technol. Aust.* 34(11); 1982; 501-7
Describes the sanitation and microbiological hazards under Indian conditions. KAR

- 3627 RIVITUSO (CP) and SNYDER (OP). Bacterial growth at food service operating temperatures. *J. Food Prot.* 44(10); 1981; 770-74
- 3628 FOEGEDING (PM) and BUSTA (FF). Bacterial spore injury. An update. *J. Food Prot.* 44(10); 1981; 776-86
- 3629 TODD (ECD). Foodborne and waterborne disease in Canada. 1976. Annual summary. *J. Food Prot.* 44(10); 1981; 787-95
- 3630 CLIVER (DO). Experimental infection by waterborne enteroviruses. *J. Food Prot.* 44(11); 1981; 861-5
- 3631 PITT (JI) and HOCKING (AD). Food spoilage fungi. I. *Xeromyces bisporus* Fraser. *CSIRO Food Res. Q.* 42(1); 1982; 1-6
- The spoilage mould *Xeromyces bisporus* Fraser is able to grow at a lower water activity than any other known organism. As a consequence, it is capable of growth in dried and concentrated foods usually regarded as safe from microbial attack, and has been the cause of significant spoilage of such products. Cultural and microscopic features of this unique fungus are described in this paper, together with its physiological properties and techniques for its isolation and maintenance. AA
- 3632 SHEPHERD (EC), PHILLIPS (TD), HEIDELBAUGH (ND) and HAYES (AW). High pressure liquid chromatographic determination of aflatoxins by using radial compression separation. *J. Assoc. Off. Anal. Chem.* 65(3); 1982; 665-71
- 3633 KLEINAU (G). On the derivatisation of ochratoxin A on the thin layer plate. *Nahrung.* 25(3); 1981; K9-K10

GENERAL

- 3634 SLATER (LE). Optimizing a nation's food system - a system engineer's view. *Indian Food Packer*. 37(1); 1983; 26-36
The article discusses the challenge for the producers, task of food professionals, reducing instability problems and of inequality in dealing with inadequacy. BSN
- 3635 MANJREKAR (SP) and ACHAYA (KT). Training facilities in food science and technology in India. *Indian Food Ind.* 2(2); 1983; 50-59
- 3636 SNYDER (OP) Jr. A management system for foodservice quality assurance. *Food Technol.* 37(6); 1983; 61-7
This article first discusses the use of a quality assurance management system in the food service industry in Minnesota, then describes the system and its principles in detail. KAR
- 3637 SUBHASH CHAND and MAHAPATRA (SN). Production of sugar syrup from Mahua (*Madhuca latifolia*). *Res. Ind.* 28(1); 1983; 29-31
The process for production of syrup from Mahua (*Madhuca latifolia*) flowers involves extraction with water, clarification, decolourisation and concentration of sugar syrup. From one ton of mahua flowers, 550 kg of sugar syrup was obtained. This light coloured syrup with characteristic mahua flower smell has a sugar content of 75-78% and a density of 1.39/ml. As a sweetening agent, it may be used for food products and in confectionery industry. BSN

FOOD PROCESSING AND PACKAGING

PROCESSING

- 3638 BAXERRES (JL), YOW (YS) and GIBERT (H). Investigation on fluidized bed drying of various food products. *Food Sci. + Technol.* 16(1); 1983; 27-31 (French)
A study on fluidized bed drying of food products, such as pre-cooked rice, diced potatoes and carrots is presented. The natural characteristics of these products - coarse sized and sticky particles - make a conventional apparatus unsuitable for their fluidization. However, this operation becomes feasible when putting the foodstuffs in a whirling bed, and mixing them with inert particles (e.g. glass spheres). Several experiments have been performed with air drying of the products after determination of the optimal whirling conditions: gas flow rate and the solid component ratio in the bed. The advantages of this technique are: uniform treatment of material and high intensity of heat and mass transfer. In certain cases, puffing can be obtained. AA

PACKAGING

- 3639 HICKS (A). The principles of food packaging. *Perfectpac.* 23(2); 1983; 5-10

- 3640 FARRER (KTH). Some current problems in food packaging. *Food Technol. Aust.* 35(3) 1983; 118-20

- 3641 DORDI (MC). Packaging of processed foods. *Perfectpac.* 23(2); 1983; 11-9

A brief review of the output of the Indian food processing industry - excluding staples like foodgrains, oilseeds, and edible fats - and processed food exports from India over the period 1971-1982. Processing cost has been compared with packaging cost in a tabular form that defies comprehension. KMD

- 3642 ROBERTSON (GL). Packaging materials for aseptic foods. *Food Technol. NZ.* 18(2); 1983; 21,23-4,27

- 3643 MAHADEVIAH (M), GOWRAMMA (RV) and NARESH (R). Identification and screening of food lacquers for canning. *Indian Food Packer.* 37(1); 1983; 63-74

The investigation deals with the standardization of chemical tests for identification of food lacquers (epoxy and phenolic). With the aid of infrared spectra, functional groups of lacquers have been identified. By employing different fruit and vegetable products, (i) papaya slices in sugar syrup, (ii) mango juice, (iii) orange juice concentrate (Brix: 60 pH), (iv) tomatopaste (Brix, 24^o pH 3.96), (v) potato in brine and (vi) ivy gourd (Kundri) in brine, studies with lacquered and plain cans have shown that the polyester lacquer is suitable for canning as it does not affect the taste or flavour of the canned products. (i) retained 7 ppm of Pb and Cu from 0.2-0.75 ppm as against nil and low amounts of Pb and Cu respectively in plain cans. In (ii), Pb was 1 ppm in both plain and lacquered cans, whereas Cu content was less than that in (i). BSN

FOOD ENGINEERING AND EQUIPMENT

- 3644 HENSLEY (J). External influences on cooling tower performance. *ASHRAE J.* 25(1); 1983; 86-9

- 3645 WALTON (JD) Jr. Development of a solar cooker using the spiral fresnel concentrator. *Appropriate Technol.* 10(2); 1983; 27-9

A simple, light weight spiral shaped point-focussing concentrator, developed at the Georgia Institute of Technology was used as the heat source for a low cost sturdy solar cooker designed in Upper Volta and tested in Mali. AA

- 3646 COOPER (PJ). NIR analysis of process control. *Cereal Food World.* 28(4); 1983; 241-5

Aspects covered in this review include process considerations, NIR applications, calibration and instrumentation. KAR

ENERGY IN FOOD PROCESSING

- 3647 DAS (SR). Energy scene in India. *Vojana.* 27(19); 1983; 12-6

- 3648 FREEMAN (R). Computer program models cogeneration system, and results in energy cost reduction. *ASHRAE J.* 25(1); 1983; 59-61

- 3649 McHALE (WE). "Found Money" for your company: Making energy management work. *ASHRAE J.* 25(2); 1983; 28-31

FOOD CHEMISTRY AND ANALYSIS

- 3650 MORIN (Ph). Definition and measure of water activity. 1. Theory. *Food Sci. + Technol.* 16(1); 1983; 59-62 (French)
Usual water activity, a_w , is not an empiric quantity. Measures are based on the theory of the absolute activity and its consequences. It is necessary to use a very well defined reference or standard state. Difficulties may arise by comparing systems at different temperatures. If ice is present, there is no real problem, although a paradoxial situation may occur. AA
- 3651 CHIRIFE (J), FAVETTO (G), FONTAN (CF) and RESNIK (SL). The water activity of standard saturated salt solutions in the range of intermediate moisture foods. *Food Sci. + Technol.* 16(1); 1983; 36-8
- 3652 BEGUIN-BRUHIN (Y), ESCHER (F), ROTH (HR) and SOLMS (J). Threshold concentration of copper in drinking water. *Food Sci. + Technol.* 16(1); 1983; 22-6
The detection threshold (by taste) of copper in water was studied under well defined conditions. A specific, five-sample test method that was adapted to the peculiar taste properties of the systems was applied. For the statistical analysis, two different computer programmes of probit analysis were applied. The thresholds of distilled water solutions were found to be 2.4-3.2 ppm copper (as Cu^{++}), and those of mineral spring water 0.8-1.0 ppm (as Cu^{++}). The lower values found for mineral spring water are probably due to a temporary stabilization of copper by CO_2 , and subsequent destabilization in the mouth cavity upon tasting. KMD
- 3653 LABUZA (T). Standard procedure for isotherm determination. *Cereal Food World.* 28(4); 1983; 258
- 3654 HALL (JM). HPLC techniques. *Cereal Food World.* 28(4); 1983; 254-5
- 3655 EDWARDS (P). Ion chromatography. A valuable analytical tool for the food chemist. *Food Technol.* 37(6); 1983; 53-6
This paper presents results obtained for the determination of sodium, potassium, calcium, nitrate, transition metals and sugars in several foods by IC. Comparable data with traditional analytical methods is also presented. KAR
- 3656 AVERILL (WF). Ion-selective electrode system measures sodium content of foods. *Food Technol.* 37(6); 1983; 44,46-52, 56
This article relates to the cost of labeling the sodium content of foods and the cost of determining it. A semiautomatic method for determining sodium content of food is described which is more accurate and less costly than the current methods. KAR
- 3657 DAVIS (EG), BARNETT (D) and MOY (PM). Determination of molecular and free sulphur dioxide in foods by headspace gas chromatography. *J. Food Technol.* 18(2); 1983; 233-40

A study was made of the equilibria between SO_2 in packaged liquid foods and gaseous SO_2 in their headspace atmospheres as a basis for a new analytical method for the determination of molecular and free SO_2 . Using a gas-chromatographic method developed previously to determine SO_2 at the 1×10^{-3} mg/l level in atmospheres saturated with water vapour, studies with aqueous solutions showed that headspace SO_2 was directly proportional to molecular SO_2 in accordance with Henry's law. Using the Henry's law constant for the $\text{SO}_2/\text{H}_2\text{O}$ system, determinations of molecular SO_2 were made on a white and a red wine and a fruit juice, each adjusted to five levels of pH to achieve different concentrations of molecular SO_2 . The results observed by the headspace method showed good agreement with those determined by a reference analytical method with white wine and fruit juice, but with red wine the reference method gave values which were more than 45% higher. Free SO_2 was determined in a range of white wines by the headspace and reference methods, and the results showed high correlations. The headspace method is rapid, precise and non-destructive. A major advantage is that, during the analysis, it does not change the complicated equilibria between SO_2 and its ionised species, hence complexes of SO_2 and food constituents are not disturbed. AA

3658 HO (C-T), and JIN (QJ). Mass spectra of some alkyloxazoles. *J. Agric. Food Chem.* 31(1); 1983; 180-81

3659 VOUTSINAS (LP) and NAKAI (S). A simple turbidimetric method for determining the fat binding capacity of proteins. *J. Agric. Food Chem.* 31(1); 1983; 58-63

A simple turbidimetric method was developed for determining the fat binding capacity (FBC) of various proteins. The turbidity was dependent on wavelength, blending time, and volume of oil. The FBC was positively affected by surface hydrophobicity (S_0) and negatively affected by the interaction of S_0 with solubility(s). A highly significant correlation ($R^2 = 0.802$, $P < 0.01$) was found between S_0 , $S_0 \times s$, and FBC of 11 food proteins tested. Advantages of the method developed include a small amount of sample required for FBC determination and the fact that the measured values would reflect the true fat binding capacity of proteins by minimizing the fat-entrapping effects. AA

3660 SHIRALKAR (ND), HARZ (H-P) and WEISSER (H). Protein determination by pulsed NMR using copper as relaxation agent. *Food Sci. + Technol.* 16(1); 1983; 18-21

3661 KESHINRO (OO). The free and total folate activity in some commonly available tropical foodstuffs. *Food Chem.* 11(2); 1983; 87-93

The free and total folate activities of common tropical food materials comprising vegetables, roots and tubers, cereals, fruits, meat products, eggs, seafoods are reported. KAR

FOOD LAWS AND REGULATIONS

3662 CHETTLE (AB). Legal constraints on profitable technical development in the food industry. *Food Technol. NZ.* 18(1); 1983; 45,47,49,51

FOOD MICROBIOLOGY

- 3663 HULTIN (HO). Current and potential uses of immobilised enzymes. *Food Technol.* 37(10); 1983; 66,68,72,74,76-8,80-1,176

This article gives an overview of the current technology of enzyme immobilization and presents a brief summary of current commercial applications, the scope for the successful use of enzymes and the technology which has been developed or in the verge of being developed. KAR

- 3664 AKPEMADO (KM) and BRACQUART (PA). Uptake of branched-chain amino acids by *Streptococcus thermophilus*. *Appl. Environ. Microbiol.* 45(1); 1983; 136-40

YEAST

- 3665 SUMBU (ZL), THONART (P) and BECHET (J). Action of patulin on a yeast. *Appl. Environ. Microbiol.* 45(1); 1983; 110-15

- 3666 GARG (SK), SUSHMA SHARMA and SANDHU (DK). Rapeseed oil meal as a substrate for single cell protein production. *Indian J. Exp. Biol.* 21(5); 1983; 297-8

Biomass production and conversion efficiency of 10 yeast species, were evaluated, to assess their utilization of rapeseed oil meal (RSOM) hydrolysate. The acid (HCl) digest prepared from RSOM supported the growth of all the yeasts. *Candida curvata* showed the maximum utilization of RSOM hydrolysate. KMD

ALGAE

- 3667 GOGATE (SS) and KRISHNAMOORTHY (TM). Uptake of tritiated lysine by fresh water alga, *Scenedesmus obliquus*. *Indian J. Exp. Biol.* 21(9); 1983; 504-6

Tritium-labelled lysine and a sequential solvent extraction procedure were used to study the distribution of tritium - released into water by the nuclear industry - in different organic constituents of the algal cells. The accumulation of tritium in algal cells was 3-4 times greater than in the tritiated water. Thus, there appears to be preferential absorption of tritium when it is present in an organic form. KMD

FUNGI

- 3668 THEJA (K), SHAMALA (TR), SREEKANTIAH (KR) and SREENIVASA MURTHY (V). Microbial degradation of cellulosic materials: screening of fungal isolates. *J. Food Sci. Technol.* (India) 20(2); 1983; 84-6

Several fungal isolates obtained from air, decaying plant debris and other sources were screened for their ability to produce cellulases both in liquid cultures and by solid state fermentations. Of the 23 isolates which showed significant activity, only *Penicillium* sp. and *Aspergillus oryzae* gave consistently high enzyme titres. A strain of *Sporotrichium pulverulentum* degraded cellulose and released large quantity (1720/g/ml) of reducing sugars into the medium. KAR

MUSHROOM

- 3669 MARTIN (AM). Submerged production of *Agaricus campestris* mycelium in peat extracts. *J. Food Sci.* 48(1); 1983; 206-7
- 3670 RAJARATHNAM (S), ZAKIA BANO and PATWARDHAN (MV). Post-harvest physiology and storage of the white oyster mushroom *Pleurotus flabellatus*. *J. Food Technol.* 18(2); 1983; 153-62
- Changes in the post-harvest storage of the mushroom *Pleurotus flabellatus* at ambient temperature were studied. There was a decrease in respiratory rate and soluble carbohydrates along with loss in water content. With progress in period of storage, the fresh mushrooms showed an increase in the activities of O-diphenoloxidas and proteases accompanied with decrease of total phenols and increase in free amino acids respectively. The degree of discolouration increased with the lapse of storage time. Fresh mushrooms (200 g) packed in 25 μ m thick polyethylene bags (16 x 25 cm) with one pin hole on either side stored up to a period of 24 hours at ambient temperature and up to a period of 6 days at 5 ± 2 C in the intact polyethylene bags. AA

FOOD ADDITIVES

- 3671 KULKARNI (PR) and JADHAV (SS). N-nitrosamines in foods. *Arogya.* 9(1); 1983; 31-45
- 3672 GOUGH (TA), WEBB (KS) and SWANN (PF). An examination of human blood for the presence of volatile nitrosamines. *Food Chem. Toxicol.* 21(2); 1983; 151-6
- 3673 LINGNERT (H) and WALLER (GR). Stability of antioxidants formed from histidine and glucose by the Maillard reaction. *J. Agric. Food Chem.* 31(1); 1983; 27-30
- 3674 PARK (CK) and KIM (DH). Relationship between fluorescence and antioxidant activity of ethanol extracts of a Maillard browning mixture. *J. Am. Oil Chem. Soc.* 60(1); 1983; 98-102
- 3675 KURECHI (T) and KUNUGI (T). Studies of the antioxidants XVII: Photooxidation products of concomitantly used butylated hydroxyanisole and propyl gallate. *J. Am. Oil Chem. Soc.* 60(1); 1983; 109-113
- 3676 ASPRY (KE) and BJELDANES (LF). Effects of dietary broccoli and butylated hydroxyanisole on liver-mediated metabolism of benzo(a) pyrene. *Food Chem. Toxicol.* 21(2); 1983; 133-42
- 3677 ANDERSON (RL). Effect of saccharin ingestion on stool composition in relation to caecal enlargement and increased stool hydration. *Food Chem. Toxicol.* 21(3); 1983; 255-7
- 3678 BEDOUKIAN (PZ). Perfumery and flavour materials. 39th annual review. *Perfum. Flavor.* 8(2); 1983; 1,3-6,8,10,12-4,16-25
- Discusses: new process for manufacture of terpene alcohols; menthol

from delta carene; perfumery and essential oils; terpenes; jasmone type compounds; ionones and related compounds; musk compounds; amber and woody odour compounds; research on aroma chemicals; research on fruit and vegetable flavours; research in dairy flavours; research in meat flavours; report on various flavours; and books and reviews. BSN

- 3679 LANGHANS (R). Collective flavour development. *Cereal Food World*. 28(3); 1983; 185-6
- 3680 BRAUN (SD), OLSON (NF) and LINDSAY (RC). Production of flavour compounds: Aldehydes and alcohols from leucine by microencapsulated cell-free extracts of *Streptococcus lactis* var. *Maltigenes*. *J. Food Biochem.* 7(1); 1983; 23-41
- 3681 VEERABHADRA RAO (M), KRISHNAMURTHY (MN), NAGARAJA (KV) and KAPUR (OP). Gas chromatographic determination of menthol in mentholated sweets and pan masala. *J. Food Sci. Technol. (India)* 20(3); 1983; 130-31
Menthol along with other flavouring materials was steam distilled and the distillate was extracted with chloroform. The dry chloroform extract was analyzed by gas chromatography. The menthol content was calculated from the area under the curve using a standard. The recovery of menthol was 100%. Some commercial mentholated sweets and pan masala (a mixture of betelnut, sugar and flavourings, etc. used for chewing in India) analysed had menthol content of 0.20-0.26 and 0.12-0.62% respectively. KAR
- 3682 FORNI (E), TRIFILO (A) and POLESELLO (A). Researches on the utilisation of the pigment from *Phytolacca decandra* L. as a food colourant: part 1. preparation of an extract free from toxic substances. *Food Chem.* 10(1); 1983; 35-46
A purification procedure was carried out in which the sapin was removed by precipitation with sulphuric acid followed by liquid-liquid partition with butanol and diethyl ether. KAR
- 3683 SUYAMA (K), TAMATE (M) and ADACHI (S). Colour stability of shisonin, red pigment of a perilla (*Perilla ocimoides* L. var. *crispa* Benth). *Food Chem.* 10(1); 1983; 69-77
- 3684 MAEKAWA (A), OGIU (T), MATSUOKA (C), ONODERA (H), FURUTA (K), TANIGAWA (H), HAYASHI (Y) and ODASHIMA (S). Carcinogenicity study of ammonia-process caramel in F344 rats. *Food Chem. Toxicol.* 21(3); 1983; 237-44
- 3685 BALAKRISHNAN (KV), CHANDRAN (CV), GEORGE (KM), NARAYANAPILLAI (OG), MATHULLA (T) and VERGHESE (J). Evaluation of curcumin. *Perfum. Flavor.* 8(2); 1983; 46-9
Since synthite P curcumin displays the highest EOA colour value of 15960, it has been suggested that a colour value of 160 may be regarded as equivalent to one percent curcumin/oids, so that contradictions that exist in the evaluation of turmeric extracts may be resolved. BSN
- 3686 WOLFES (H) and SCHUGERL (K). Foam behaviour of biological media VIII. Surface properties. *European J. Appl. Microbiol. Biotechnol.* 17(6); 1983; 371-5

Surface tension, surface viscosity and foaming were investigated as functions of the BSA concentration, salt type, and concentrations of salts and antifoam agent (Desmophen 3600). The same surface properties were measured with defined media of *Hansenula polymorpha* and *Escherichia coli*. Salts and the antifoam agent considerably influence the surface properties. The cultivation time and the soluble protein content (above 5 mg l⁻¹) have only a slight effect on the surface properties. AA

- 3687 CRANSTON (PM). Alginic acid derivatives as a solidifying agent for microbiological nutrient suspension. *Food Technol. Aust.* 35(3); 1983; 135-6

This paper describes a new technique, whereby the chemical and physical properties of alginic acid derivatives have been adapted to solidify commonly used microbiological culture media. The concept is now patented and eliminates the need for heating or steam sterilising to liquefy the solidifying agent before it can be poured into appropriate sterile receptacles. KAR

CEREALS

- 3688 DASHEK (WV), EADIE (T), LLEWELLYN (GC), OLENCHOCK (SA) and WIRTZ (GH). Thin layer chromatographic analysis of possible aflatoxins within grain dusts. *J. Am. Oil Chem. Soc.* 60(3); 1983; 563-6

- 3689 GHIASI (K), HOSENEY (RC) and VARRIANO-MARSTON (E). Effects of flour components and dough ingredients on starch gelatinization. *Cereal Chem.* 60(1); 1983; 58-61

In high-water systems, starch and flour gave the same endotherm initiation temperatures. In low-water systems, however, the second (higher temperature) differential scanning calorimeter peak was much smaller with starch than with flour. As the level of gluten or xanthan gum mixed with starch was increased, the size of the second differential scanning calorimeter peak increased. We speculated that in a starch system, water migrates during starch gelatinization. In dough, gluten severely limits such migrations. That phenomenon and the fact that some areas within each starch granule require a higher temperature to gelatinize explains the effects noted in limited-water systems. As the level of sucrose was increased in a dough, the transition temperature increased, and the gelatinization temperature range decreased. At the level found in bread doughs, both sugar and salt increased starch gelatinization temperature. The two ingredients have an additive effect on gelatinization temperature, whereas shortening shows no effect. AA

- 3690 SANDER (EH). Dextrins - starch degradation products for food use, part II. *Cereal Food World.* 28(4); 1983; 257

- 3691 BAKER (D). The determination of fiber in processed cereal foods by near-infrared reflectance spectroscopy. *Cereal Chem.* 60(3); 1983; 217-9

- 3692 FROLICH (W) and HESTANGEN. Dietary fiber content of different cereal products in Norway. *Cereal Chem.* 60(1); 1983; 82-3

- 3693 RAGHAVENDRA RAO (SN), SREEDHARA MURTHY (S) and DESIKACHAR (HSR). Effect of heat processing on the paste viscosity of cereal flours. *J. Food Sci. Technol. (India)* 20(3); 1983; 95-7

Paddy, wheat, sorghum, ragi, bajra, maize and Bengal gram were heat processed separately by parboiling (soaked in hot water at 60 C for 3 hours and steamed for 30 minutes and dried) flaking (soaked for 30 minutes and steamed for 30 minutes at 15 psig and flaked) toasting (at 100 C for 10 minutes), puffing (mixed with 2 kg sand and heated at 260-280 C), and malting (soaked for 16 hours and germinated for 24-30 hours and toasted to 80 C). All forms of heat processing generally increased the cold slurry viscosity, but decreased the hot paste viscosity of the flours as compared with unheated control samples. Puffing and flaking produced greater reduction in hot paste viscosity, while parboiling and toasting effected smaller changes. The more severe the heat treatment, the lower was the hot paste viscosity. Dry toasting at 100 C had a very low effect in reducing hot paste viscosity. Malting appears to be the most appropriate method for reducing hot paste viscosity followed by puffing and flaking. KAR

RICE

- 3694 BOGAHAWATTE (C). Stimulating the impact of the changes in wheat flour imports and world price of rice on the supply and demand for rice in Sri Lanka. *Indian J. Agric. Econ.* 38(1); 1983; 15-26
- 3695 PRABHA (T). Government operations in rice: A case study of Tamil Nadu. *Indian J. Agric. Econ.* 38(1); 1983; 27-36
- 3696 ITO (S), SUZUKI (T) and FUJINO (Y). Wax lipid in rice bran. *Cereal Chem.* 60(3); 1983; 252-3
- 3697 CHEN (YL) and KUNZE (OR). Effect of environmental changes on rice yield and particle size of broken kernels. *Cereal Chem.* 60(3); 1983; 238-41
- Rough rice direct from the field or from storage usually provides a biased sample for moisture adsorption experiments because these samples contain kernels with fissures from previous environmental exposures. Control samples showed 11.1 percentage points more total yield than head rice yield for Labelle, and 20.7 percentage points more for Brazos rice. A sudden exposure of rough rice to a relative humidity increase of 30 percentage points or more caused a further reduction in head rice yield. Rice variety and grain type are also factors that influence the loss of grain quality. Rough rice samples at 9.4% moisture (dry basis) showed lower head yields at 20 than at 30 C, but temperature had little or no effect on rough rice samples at 11.9% moisture (dry basis). The weight ratio of small kernel fragments to large kernel fragments in a milled sample was less responsive to environmental exposures than was the head yield. AA
- 3698 SCHWARTZ (SJ), VON ELBE (JH) and LINDSAY (RC). Influence of processing on the pigmentation of wild rice grain. *J. Agric. Food Chem.* 31(2); 1983; 349-52
- 3699 El-MASRY (HG). Utilisation of Egyptian rice straw in production of cellulases and microbial protein: Effect of various pretreatments on yields of protein and enzyme activity. *J. Sci. Food Agric.* 34(7); 1983; 725-32
- Rice straw was chosen as a cheap carbon source for SCP production using a locally isolated fungus identified as *Trichoderma harzianum*. The chemical constituents of the raw material were cellulose 43%, hemicellulose

26% and relatively low lignin, 16%. The effects of chemical and physical pretreatments on the protein production, cellulase activity and cell mass of *T. harzianum* have been investigated. Pretreatment of the raw material using a combination of NaOH and high pressure steam treatment increased its microbial digestibility from 24% to 73%. Similar results were obtained by pretreatment with sodium chlorite for holocellulose formation. However, maximum yields of cell mass and protein were obtained by the first method. The organism gave 7.18 g litre⁻¹ cell mass and 2.50 g litre⁻¹ mycelial protein. Treatment with sodium chlorite increased cellulase activities but gave a lower fungal yield. When the NaOH was applied with high pressure steam, the organism produced 32.8% crude protein, a yield similar to that given by the same organism cultured on soluble carboxymethylcellulose. AA

- 3700 SINGARAVADIVEL (K) and ANTHONI RAJ (S). Changes in parboiled rough rice caused by improper drying and microbial infection. *J. Food Biochem.* 7(1); 1983; 15-21

Molds and bacteria contaminate parboiled rough rice when it is improperly dried or while awaiting drying due to humid rainy weather. When IR 20 parboiled rough rice was not dried for 7⁴ days due to humid weather, molds increased to 2.45×10^7 per gram from 6×10^4 per gram and bacteria increased to 75.9×10^6 per gram from 5.1×10^6 per gram observed initially. The milled rice yield decreased to 60.1% from 72.2% and the head rice yield decreased to 55.0% from 98.8% due to infection. The resultant bran contained only 12.1% oil compared to 31.9% in normally dried and milled paddy with about 40.0% free fatty acids in oil. The infection induced breakdown changes increased the levels of sugars, amino acids and polyphenols in grains which might cause kernel discolouration in the associated heat development during infection. AA

- 3701 RAMARATHNAM (N), BANDYOPADHYAY (C) and KULKARNI (PR). Comparative studies on volatile components of scented and non-scented rice. *J. Food Sci. Technol.* (India) 20(2); 1983; 43-7

These preliminary observations deal with the extraction, concentration and characterization of volatiles responsible, for the unique flavour of 'Basmati' (scented) and 'common' (non-scented) rice variety of India. Rice volatiles were isolated by distillation extraction and analyzed by TLC and GLC. Considerable similarities were noticed in the qualitative composition of volatiles of both the rice variety. The aroma components having characteristic 'Basmati' odour in scented rice appeared to be polar in nature and present in minute amounts. AA

- 3702 PILLAIYAR (P) and MOHANDOSS (R). A simple dropping method for determining the texture in parboiled rices. *J. Food Sci. Technol.* (India) 20(1); 1983; 34-6

Optimally cooked, mild to severely parboiled rice samples after 1 hour of cooking are taken in a rectangular box having flap doors at the bottom. On instantaneously opening the flap doors, the grains fall on a glass plate kept 75 cm below the box. The glass plate is marked with concentric circles of 5 cm radial difference and the grains that occupy different circles are collected separately and weighed quickly. More severe the parboiling, greater was the area to which the cooked rice got distributed. Based on the proportion of grains that occupied the first two circles, the parboiled samples could be graded for their texture. Samples were graded

as 'tough', when more than half of the grains got distributed beyond 10 cm radius from the central point of drop. AA

- 3703 UNNIKRISHNAN (KR) and BHATTACHARYA (KR). Cold-slurry viscosity of processed rice flour. *J. Texture Stud.* 14(1); 1983; 21-30

Viscosities of dispersions of raw and various processed rice flours in water were examined with a coaxial cylinder viscometer. The measured viscosity increased with increasing degree of processing and with a reduced level of apparent starch reassociation in the processed rice. Measurement of the apparent viscosity of cold slurries could thus be a simple practical test of processed, including parboiled, rice and of the degree of processing. The system showed time-dependent thinning and a typical loop in the shear rate-viscosity curve, showing that it was thixotropic in nature. The viscosities were proportional to the hydration power and slurry-sedimentation behaviour of the samples. AA

WHEAT

- 3704 BARUCH (DW), JENKINS (LD), DENGATE (HN) and MEREDITH (P). Nonlinear model of wheat starch granule distribution at several stages of development. *Cereal Chem.* 60(1); 1983; 32-5

- 3705 LILLARD (DW) Jr. and HERTSGAARD (DM). Computer analysis and plotting of milling data: HRS wheat cumulative ash curves. *Cereal Chem.* 60(1); 1983; 42-6

- 3706 EVANS (DE), THORPE (GR) and DERMOTT (T). The disinfestation of wheat in a continuous-flow fluidized bed. *J. Stored Prod. Res.* 19(3); 1983; 125-37

A continuous-flow, fluidized bed heating system, capable of treating up to 500 kg grain hr^{-1} , was used to study particle dispersion during heating and to determine the influence of dispersion, air inlet temperature and other operating variables on the mortality of the immature stages of *Rhyzopertha dominica* within wheat. A mathematical model was derived to represent longitudinal mixing within the bed. Increasing the number of baffles (and thus chambers) within the bed decreased the degree of dispersion. Dispersion within a heating bed of four chambers did not appear to influence insect mortality. Inlet air temperature (77.8-90.1 C), air mass flow (0.25 or 0.32 kg sec^{-1}), initial grain temperature (15.2-27.2 C), and the number of chambers within the heating bed (4 or 8) all influenced the maximal temperature of the grain during heating. The mortality achieved (80.6-100%) depended largely on maximal grain temperature, complete kills being obtained consistently with maximal grain temperatures of 64.9 C or higher. By contrast, variation in mean residence time (120-240 sec) had no significant influence on either maximal grain temperature or insect mortality. AA

- 3707 NAGI (HPS) and BAINS (GS). Effect of scouring and conditioning variables on milling rheological and baking properties of Indian wheats. *J. Food Sci. Technol. (India)* 20(2); 1983; 122-4

The effect of varying moisture levels (14.5, 15.5 and 16.5%), tempering times (24, 48 and 72 hours), without and with scouring on milling, rheological and baking properties of 'WG 357' and 'WG 377' varieties of wheat, was investigated. Wheat conditioned to 16.5% moisture produced flour with high damaged starch, finer granulation and higher water absorption as

compared with the flours milled from wheat conditioned at 14.5 and 15.5% moisture. Scouring prior to conditioning increased the yield of flour, but produced relatively coarser flour than the control samples. Moisture, scouring and duration of tempering had no effect on the extensibility characteristics of both the varieties, but farinograph water absorption was slightly decreased with scouring treatment. AA

- 3708 SATTERLEE (LD) and ABDUL-KADIR (R). Effect of phytate content on protein nutritional quality of soya and wheat bran proteins. *Food Sci. + Technol.* 16(1); 1983; 8-14

Removal of phytate from soy protein isolate (Promine D) did not improve the nutritional quality of the soy protein; but when the phytate content of high protein bran flour (HPBF) from wheat bran was reduced, there was a significant improvement in the nutritional quality of the wheat protein. KMD

- 3709 WILLIAMS (PC), NORRIS (KH), GEHRKE (CW) and BERNSTEIN (K). Comparison of near-infrared methods for measuring protein and moisture in wheat. *Cereal Food World.* 28(2); 1983; 149-52

Protein and moisture were determined in 120 samples of hard red spring wheat by near-infrared reflectance spectroscopy (NIRS), using two computerized spectrophotometers and 10 methods incorporating commercial portable NIRS instruments. The results were statistically compared with a definitive series of Kjeldahl and single-stage air oven moisture results. The respective techniques are discussed in terms of accuracy, precision, and effectiveness of instrument operation. NIRS protein methods generally gave results that were adequate for all quality control purposes and, in some cases, the results were superior to those obtained through certain physico-chemical techniques. AA

- 3710 WILLIAMS (PC) and NORRIS (KH). Effect of mutual interactions on the estimation of protein and moisture in wheat. *Cereal Chem.* 69(3); 1983; 202-7

Separate calibrations were set up for hard red spring wheat. Moisture content was varied from 15 to 2% by high-vacuum drying. Calibration files included 50 samples in each of five moisture ranges. Additional calibrations were run on oven-dried material. The Beltsville computerized spectrophotometer was used to select optimum and reference wavelengths for the prediction of protein and moisture. Essentially, no differences were observed in the wavelengths selected for protein, but pronounced shifts occurred in the wavelengths selected for moisture determination in materials of different moisture levels. The calibrations were then used to estimate protein and moisture in "unknown" files. The most satisfactory algorithm for measuring protein in the presence of wide variations in moisture content was the normalized delta log I/R divided by delta log I/R₂ algorithm. For the measurement of moisture, several algorithms were essentially equal in efficiency. The selection of optimum wavelengths for prediction based on large numbers of samples is discussed relative to wavelength selections based on smaller numbers of samples with less variance. AA

- 3711 POMERANZ (Y) and DIKEMAN (E). Minerals and protein contents in hard red winter wheat flours. *Cereal Chem.* 60(1); 1983; 80-82

Twenty composite, experimentally milled, hard red winter wheat flours were analyzed for protein, ash, P, K, Mg, Ca, Zn, Fe, Mn, and Cu. Ten

flours were location composites; each composite represented equal quantities of flour from 25 wheat cultivars/selections at a location. The other 10 flours were cultivar/selection composites; each composite represented equal quantities of flour from a wheat cultivar/selection grown at 23 locations in the Great Plains. Average flour milling extractions were 73.5% for the location composites and 72.9% for the cultivar/selection composites. Composition ranges and coefficients of variation of the location composites generally were larger than composition ranges and coefficients of variation of the cultivar/selection composites. Flour protein was over 90% of the wheat protein; total ash and individual flour minerals generally were less than one third of the wheat minerals. The average content of individual flour minerals, as percentage of the wheat minerals, was 66% for Ca; 20-30% for P, K, Mg, Zn, Fe and Cu; and about 13% for Mn, both in the location and in the cultivar/selection composites. The most consistent correlations among wheat and flour components were between protein and Zn, and between Zn and Fe for the cultivar/selection composites and between protein and Ca for the location composites. AA

3712 LOOKHART (GL), JONES (BL), WALKER (DE), HALL (SB) and COOPER (DB). Computer-assisted method for identifying wheat cultivars from their gliadin electrophoregrams. *Cereal Chem.* 60(2); 1983; 111-5

3713 KHAN (K), McDONALD (CE) and BANASIK (OJ). Polyacrylamide gel electrophoresis of gliadin proteins for wheat variety identification - procedural modifications and observations. *Cereal Chem.* 60(2); 1983; 178-81

3714 FULLINGTON (JG), COLE (EW) and KASARDA (DD). Quantitative sodium dodecyl sulphate-polyacrylamide gel electrophoresis of total proteins extracted from different wheat varieties: Effect of protein content. *Cereal Chem.* 60(1); 1983; 65-71

Total proteins were extracted from flour or seed samples differing in protein content for each of four wheat (*Triticum aestivum* L.) varieties Prodx, Wanser, Atlas 66, and Nugaines, with buffers containing sodium dodecyl sulphate and mercaptoethanol. The reduced proteins were fractionated according to molecular weight by two methods of sodium dodecyl sulphate-polyacrylamide gel electrophoresis, one giving much higher resolution than the other, and the results quantified by densitometry of the stained patterns. The patterns were considered in terms of five different molecular weight ranges that corresponded, to an extent, to the solubility fractions of wheat flour proteins. The proportion of low molecular weight albumins and globulins decreased significantly with increase in protein content for all four varieties, whereas the proportion of gliadins increased significantly for all but Atlas 66, both samples of which had relatively high protein content. The two methods yielded significantly different results for some of the molecular weight ranges considered; methods of staining and destaining gels that affected the amount of sodium dodecyl sulphate remaining complexed with the proteins also affected the results. AA

3715 HSU (E) and VARRIANO-MARSTON (E). Comparison of nephelometric and phadebas methods of determining alpha-amylase activity in wheat flour supplemented with barley malt. *Cereal Chem.* 60(1); 1983; 46-50

3716 MITA (T) and BOHLIN (L). Shear stress relaxation of chemically modified gluten. *Cereal Chem.* 60(2); 1983; 93-7

- 3717 JENSEN (SA) and MARTENS (H). The botanical constituents of wheat and wheat milling fractions. II. Quantification by amino acids. *Cereal Chem.* 60(2); 1983; 172-7

The amino acid composition of manually dissected pericarp, testa, aleurone, endosperm, and germ from wheat was determined and compared to the amino acid composition of 50 wheat milling fractions. The data obtained were used in a multiple linear regression to quantify the botanical composition of pericarp, aleurone, endosperm, and germ in the wheat milling fractions. Comparison for pericarp, aleurone, and endosperm to an earlier method based on autofluorescence characteristics showed good agreement for pericarp and endosperm, whereas that of aleurone showed a lower correlation coefficient. Correlation to chemical constituents ash, fiber, starch, and niacin of both sets of measurements established that the differences between the two independent methods were due to inadequacies in the amino acid model rather than in the fluorescence method. AA

- 3718 HARIDAS RAO (P), LEELAVATHI (K) and SHURPALEKAR (SR). Comparative studies on atta (whole wheat flour) and resultant atta, a by-product, of roller flour milling industry. *J. Food Sci. Technol.* (India) 20(1); 1983; 5-8

The resultant atta from roller flour mills contained lesser proteins, ether extractives and ash than the whole wheat flour (atta) processed in chakki (disc mill). The starch damage in whole wheat flour (13.3 to 19.1%) was nearly double than that in resultant atta and indicated greater severity of grinding in chakki. The chapati water absorption as well as Fari-nograph water absorption and the dough development time were significantly higher for atta. The dough based on resultant atta had more resistance to extension and extensibility than the dough based on atta. The chapaties made from atta were better than those from resultant atta in eating quality and flavour. AA

- 3719 RAM (BP) and NIGAM (SN). Sedimentation and extensograph characteristics of some wheats in relation to gluten composition. *J. Food Sci. Technol.* (India) 20(3); 1983; 128-9

Micro-sedimentation values and extensograph characteristics of the flours and doughs of eleven wheat varieties were studied. The results have shown that the quantities of gliadin (GD) and glutenin (GTN) correlate negatively, and the quantity of residue protein (RP) and the ratio of the quantities of RP to GD plus GTN (RP/GD+GTN) correlate positively with micro-sedimentation and extensograph characteristics of flours and doughs. Best correlation was shown with the quantity of RP. AA

- 3720 ARYA (SS) and NARASIMHA MURTHY (MC). Effect of surfactants, fatty acids and glycerides on the gelatinization viscosity of atta (wheat flour). *J. Food Sci. Technol.* (India) 20(3); 1983; 116-7

Free fatty acids, glycerides and vegetable oils were added at 0.5 to 5% levels to wheat flour used for chapati making. Peak gelatinization viscosity increased while amylose solubility decreased as a result of addition of fatty acids, mono- and di-glycerides and surfactants. Vegetable oils, triglycerides, guar gum, locust bean gum, carrageenan, carboxymethyl cellulose, sorbitol, butyl- and amyl-alcohols, however, showed no effect on the gelatinization behaviour of atta. AA

- 3721 OOMAH (BD). Baking and related properties of wheat-oat composite flours. *Cereal Chem.* 60(3); 1983; 220-25

Composite blends of wheat and oat flours were evaluated in terms of their bread- and cookie-making quality. Two different oat flours were investigated in composites containing up to 25% oat flour. Dough development time, dough strength, centrifuge water retention, and loaf volume decreased, and mixing tolerance increased as the amount of oat flour in the composite increased. Slight differences existed between the two oat flours in the magnitude of effects, pasting behaviours, and loaf-volume response to oxidants and sodium stearyl-2-lactylate. There was no significant difference in the rate of gas production of wheat flour and composite doughs. Cookie spread factors increased with increasing amounts of roller-milled oat flour in the formulation, whereas those of Quaker oat flour composites remained constant. AA

- 3722 DAHLQVIST (A), BJORCK (I), THEANDER (O) and CONRAD (E). New products from wheat. *Food Chem.* 11(1); 1983; 51-62

By extraction of wheat, rather than grinding low bulk solutions containing not only most of the protein and the partly hydrolysed starch of the wheat grain, but also the vitamins from the wheat bran could be obtained which shows new avenues for the technological use of wheat. KAR

- 3723 PAREDES-LOPEZ (O) and BUSHUK (W). Development and "Undevelopment" of wheat dough by mixing: Physico-chemical studies. *Cereal Chem.* 60(1); 1983; 19-23

- 3724 PAREDES-LOPEZ (O) and BUSHUK (W). Development and "Undevelopment" of wheat dough by mixing: Microscopic structure and its relations to bread-making quality. *Cereal Chem.* 60(1); 1983; 24-7

Scanning electron microscopy (SEM) of dough revealed changes in dough microstructure during development and undevelopment. There was evidence that undevelopment transformed the gluten of optimally developed dough from a continuous membrane like structure into a discontinuous meshlike structure. SEM of gliadins and glutenins isolated from doughs showed structural differences between mixing treatments. Undevelopment transformed glutenins from a fibrillar structure into one that contained ruptured membranes and numerous particles or globules. On the basis of the SEM results and other analytical results, we postulated that undevelopment results in the association of gluten proteins (mainly glutenin) into aggregates. This structural change transformed the membranelike structure of optimally developed gluten with good gas retention capacity, into a fibrillar or globular structure with poor gas retention capacity. The exact nature of the forces involved in the aggregation process remains to be discovered. AA

- 3725 TERADA (M), MINAMI (J) and YAMAMOTO (T). Characteristics of bread and sponge cake baked from wheat flour exposed to gaseous ammonia. *Cereal Chem.* 60(1); 1983; 90-92

Dough made from flour exposed to gaseous ammonia shows rheological properties similar to properties of doughs made from heat-conditioned flour or flour containing oxidizing agents. The effects of ammonia treatment on breads and sponge cakes are described. AA

OAT

- 3726 URQUHART (AA), ALTOSAAR (I), MATLASHEWSKI (GJ) and SAHASRABUDHE (MR). Localization of lipase activity in oat grains and milled oat fractions. *Cereal Chem.* 60(2); 1983; 181-3
- 3727 ROBERT (LS), MATLASHEWSKI (GJ), ADELI (K), NOZZOLIILLO (C) and ALTOSAAR (I). Electrophoretic and developmental characterization of oat (*Avena sativa* L.) globulins in cultivars of different protein content. *Cereal Chem.* 60(3); 1983; 231-4
- 3728 MA (C-Y). Chemical characterization and functionality assessment of protein concentrates from oats. *Cereal Chem.* 60(1); 1983; 36-42

RYE

- 3729 SHEWRY (PR), PARMAR (S) and MIFLIN (BJ). Extraction, separation, and polymorphism of the prolamin storage proteins (Secalins) of rye. *Cereal Chem.* 60(1); 1983; 1-6

MILLETS

- 3730 COOK (LW), ZACH (FW), KLOSTERMAN (HJ) and BRISTOL (DW). Comparison of free and total residues of (2,4-dichlorophenoxy)acetic acid and 2,4-dichlorophenol in millet resulting from postemergence and preharvest treatment. *J. Agric. Food Chem.* 31(2); 1983; 268-71

SORGHUM

- 3731 SATISH (S), GURUMURTHY and MISHRA (SK). Cycles in jowar markets. An use of harmonic analysis. *Indian J. Agric. Econ.* 38(1); 1983; 77-82
- 3732 WILLS (RBH) and ALI (MR). Effect of grain size on dehulling of sorghum. *Cereal Chem.* 60(1); 1983; 12-4
- Ungraded and sized grain (<4.00 mm; <3.35 and <2.80 mm, respectively) of 28 sorghum cultivars were dehulled by abrasion for 60 sec. The milling recovery varied between cultivars but generally ranged from 80 to 90%. The milling recovery was higher for grain < 2.80 mm than for grain <3.35 mm, and grain < 4.00 mm gave the lowest recovery. The recovery of ungraded grain did not follow a trend but often gave yields lower than what would be expected from the average size. The amount of unbroken kernels in the milled fraction also varied with grain size, with the average amounts obtained for <2.80-, <3.35-, and <4.00 mm grain being 84, 78, and 72%, respectively. Broken kernels accounted for most of the damaged grain, with only a small proportion of degermed kernels present. For optimal yields during dehulling, cultivars with grain of nonuniform size should be segregated into different sizes and each size graded dehulled for different times. AA
- 3733 SCHEURING (JF), SIDIBE (S), ROONEY (LW) and EARP (CF). Sorghum pericarp thickness and its relation to decortication in a wooden Mortar and pestle. *Cereal Chem.* 60(1); 1983; 86-9

- 3734 GLENNIE (CW), HARRIS (J) and LIEBENBERG (NVDW). Endosperm modification in germinating sorghum grain. *Cereal Chem.* 60(1); 1983; 27-31
- 3735 PATHIRANA (RA), SIVAYOGASUNDARAM (K) and JAYATISSA (PM). Optimisation of conditions for malting of sorghum. *J. Food Sci. Technol. (India)* 20(3); 1983; 108-111
- Malting conditions for sorghum were determined by varying the periods of steeping (8-32 hours), and germination (2-6 days) and the temperature of heat treatment (80-100 C). The parameters used to assess the malt quality were the malting loss, cold and hot water extracts, reducing sugar content of the extract, diastatic power and liquefying power. A steeping time of 18 hours and a germination time of 4-5 days were found to be optimum for malting. Kilning at 100 C for 3 hours was found sufficient. KAR
- 3736 JAMBUNATHAN (R), RAO (NS) and GURTU (S). Rapid methods for estimating protein and lysine in sorghum (*Sorghum bicolor* (L.) Moench). *Cereal Chem.* 60(3); 1983; 192-4
- Sorghum (*Sorghum bicolor* (L.) Moench) samples were analyzed for protein by the Technicon auto analyzer (TAA) method, and the results were compared with the micro-Kjeldahl method. The TAA method was highly and significantly correlated ($r = 0.997^{**}$) with the micro-Kjeldahl method, and the results were found to be highly reliable for routine screening of samples. Lysine was estimated by the rapid dye-binding capacity (DBC) procedure and was determined using an amino-acid analyzer. The results of the DBC procedure, when expressed as a ratio with respect to the protein content, were highly and positively correlated ($r = 0.933^{**}$) with the amino acid analyzer values. The rapid procedures of TAA and DBC were observed to give reliable estimates of protein and lysine content, respectively, and are recommended when large numbers of sorghum samples are to be analyzed. AA
- 3737 SEITZ (LM), MOHR (HE), BURROUGHS (R) and GLUECK (JA). Preharvest fungal invasion of sorghum grain. *Cereal Chem.* 60(2); 1983; 127-30
- 3738 McMILLIAN (WW), WILSON (DM), MIROCHA (CJ) and WIDSTROM (NW). Mycotoxin contamination in grain sorghum from fields in Georgia and Mississippi. *Cereal Chem.* 60(3); 1983; 226-7
- Samples of preharvest sorghum grains from fields in Georgia coastal plain in 1980 and 1981 showed that there was a 56% incidence of aflatoxin contamination ranging from 1 to 90 ppb. 15% of grains were found to be contaminated with zearalenone ranging from 2 to 1468 ppb. BSN

SWEET SORGHUM

- 3739 HAWKE (SJ), PANTER (C), HAYES (M) and NGUYEN (MH). Selection of yeasts for fermentation of sweet sorghum juice to alcohol. *Food Technol. Aust.* 35(3); 1983; 123-5
- In this investigation, 33 yeasts were screened for fermentation of sweet sorghum juice to alcohol. On the basis of this screening seven yeasts were selected for different fermentation systems. Those chosen included *Saccharomyces cerevisiae*, *Sacch. diastatiens*, *Sacch. carlsbergensis* and *Sacch. chevalier* strains. KAR

MAIZE

- 3740 SUNG (IM) and LAMBERT (RJ). Ninhydrin colour test for screening modified endosperm opaque-2 Maize. *Cereal Chem.* 60(1); 1983; 84-5
- 3741 ORTEGA (EI) and BATES (LS). Biochemical and agronomic studies of two modified hard-endosperm opaque-2 maize (*Zea mays* L.) populations. *Cereal Chem.* 60(2); 1983; 107-11
- 3742 CHRISTIANSON (DD) and BAGLEY (EB). Apparent viscosities of dispersions of swollen cornstarch granules. *Cereal Chem.* 60(2); 1983; 116-21
- 3743 ECKHOFF (SR), TUIITE (JF), FOSTER (GH), KIRLEIS (AW) and OKOS (MR). Microbial growth inhibition by SO₂ or SO₂ plus NH₃ treatments during slow drying of corn. *Cereal Chem.* 60(3); 1983; 185-8
- 3744 BELL (WL). The use of NIR as a process control tool for wet corn milling. *Cereal Food World.* 28(4); 1983; 249-51
 NIR analysis can be used as a versatile process control instrument in corn wet milling. Many different processes in a wet corn mill benefit from rapid, accurate analyses provided by NIR. These analyses result in improved control of the process flow and on going separation of components, thus producing more uniform quality in the final product. AA
- 3745 SCHONHAUS (I) and SGARBIERI (VC). Inherited characteristics of composition and protein nutritive value of a new cultivar of maize (Nutrimaiz) in two stages of maturity. *J. Agric. Food Chem.* 31(1); 1983; 1-7
- 3746 CARASIK (W) and CARROLL (JO). Development of immobilized enzymes for production of high-fructose corn syrup. *Food Technol.* 37(10); 1983; 85-91
- 3747 STAUFFER (CE). Corn-based snacks. *Cereal Food World.* 28(5); 1983; 301-2

BARLEY

- 3748 LAMKIN (WM), NELSON (SW), MILLER (BS) and POMERANZ (Y). Glutamic acid decarboxylase activity as a measure of percent germination for barley. *Cereal Chem.* 60(2); 1983; 166-71

PULSES

- 3749 SOBTI (R). Acceptability of the food preparations from the fumigated pulses. *Indian J. Agric. Sci.* 53(9); 1983; 837-41
 Green gram (*Vigna radiata* Linn.) and chickpea (*Cicer arietinum*) fumigated with aluminium phosphide were converted into dal (cotyledons) and flour and analysed at intervals of 0,2,5,12 and 27 days. The pulses were also cooked whole or as dal, or made into parantha (fried pancakes). With all the above processes there was significant reduction in phosphine residue. No effect of fumigant residues on sensory properties were observed except, appearance of whole-cooked greer gram, doneness in whole-cooked chickpea and softness in green-cooked parantha. MVG

CHICK PEA

- 3750 GERSCHENSON (LN), BOQUET (R) and BARTHOLOMAI (GB). Effect of thermal treatments on the moisture sorption isotherms of protein isolate, starch and flour from chick pea (*Cicer arietinum* L.). *Food Sci. + Technol.* 16(1); 1983; 43-7

Samples of protein, starch and flour from chickpea were equilibrated to a moisture content of about 2% and 12% and subjected to thermal treatment at 90 C for 48 hours. The water sorption isotherms at 37 C were subsequently determined and compared with that of a control sample which had not suffered heat treatment. Samples heated 48 hours at 90 C with a moisture content of about 2% showed a significant reduction in their water sorption capacity evaluated on adsorption isotherms. Samples heated 48 hours at 90 C with a moisture content of about 12% showed, too, a significant reduction in their water sorption capacity evaluated on desorption isotherms. AA

- 3751 ABDEL-RAHMAN (A-HY). Effect of cooking on tryptophan, basic amino acids, protein solubility and retention of some vitamins in two varieties of chick pea. *Food Chem.* 11(2); 1983; 139-43

Egyptian and Italian varieties of chick pea were analysed chemically to study their total constituents. The two varieties were cooked for 1 and 2 hours and autoclaved for 1 hour at 121 C. Their constituent basic amino acids, tryptophan, thiamin, pyridoxin and niacin, were determined. There were differences in the chemical constituents between the two varieties. Cooking decreased lysine, histidine and arginine, the effect being highly significant. Tryptophan decreased, the effect being significant. In addition, protein solubility decreased with increased cooking time. The vitamin content also decreased with increased cooking time. It is preferable to cook chick pea in an autoclave at 121 C for not more than 1 hour to minimise losses in vitamins and amino acids. AA

- 3752 KUMAR (J), GOWDA (CLL), SAXENA (NP), SETHI (SC), SINGH (U) and SAHRAWAT (KL). Effect of salinity on protein content and seed size of chick pea (*Cicer arietinum* L.). *Curr. Sci.* 52(2); 1983; 82-3

Protein content seed size of chickpea (genotypes Desi and Kabuli) grown on highly saline soils were determined. Data show that per cent seed protein and 100-seed weight was significantly reduced by salinity. MVG

KINTOKI BEAN

- 3753 TSUKAMOTO (I), MIYOSHI (M) and HAMAGUCHI (Y). Heat inactivation of trypsin inhibitor in kintoki bean (*Phaseolus vulgaris*). *Cereal Chem.* 60(3); 1983; 194-97

Crude extract from kintoki bean (*Phaseolus vulgaris*) lost approximately 90% of the trypsin inhibitory activity after heating at 100 C for 60 minutes, but purified trypsin inhibitor was heat-stable. Heat treatment caused inactivation of the purified trypsin inhibitor when protein such as albumin or high molecular weight proteins from bean extract was present. The extent of the inactivation increased with the concentrations of the trypsin inhibitor and total protein. AA

LATHYRUS

- 3754 REDDY (BN) and NUSRATH (M). Aflatoxin contamination in normal and insect-damaged Kesari (*Lathyrus sativus* L.) in Andhra Pradesh. *Curr. Sci.* 52(8); 1983; 370-71

Fungi associated with *Lathyrus* grains (66 samples) from Medak district of Andhra Pradesh were isolated, identified and studied for relative abundance. The moisture content of the samples was 9.21%. 36 samples were insect damaged. Only 26 samples gave BGY (bright greenish yellow) fluorescence under long wave (36 nm) UV light of which 12 were insect-damaged and 7 were non-insect damaged. The aflatoxin content ranged from 12 to 115 ppb. Aflatoxin B-1 was recorded the highest (115 ppb) and aflatoxin G-1 was the lowest (12 ppb). One non-insect damaged sample contained aflatoxin G-1. All toxin-containing samples were positive for BGY fluorescence. In 75% of insect damaged samples and 57% of non-insect damaged samples, the aflatoxin was >20 ppb. MVG

LIMA BEAN

- 3755 ALLI (I) and BAKER (BE). Constitution of leguminous seeds. Polyacrylamide-disc gel electrophoresis of acid soluble and acid precipitated proteins prepared from baby lima beans. *J. Sci. Food Agric.* 34(7); 1983; 737-42

Acid soluble proteins (bipyramidal crystalline, 76.9% protein, 15% carbohydrate) prepared by citric acid extraction and acid precipitated proteins (amorphous, 64.2% protein, 11.3% carbohydrate) prepared by alkali extraction from baby lima beans (*Phaseolus lunatus*) were found to behave in a similar manner under alkaline conditions (pH 8.9) of electrophoresis (absence of urea). Striking differences were observed in the behaviour of the two types of protein preparations when electrophoresis was performed under acidic conditions (pH 4.5; absence and presence of urea and a mixture of urea and 2-mercaptoethanol) and in the presence of sodium dodecyl sulphate. AA

- 3756 OLOGHOBO (AD) and FETUGA (BL). Trypsin inhibitor activity in some lima bean (*Phaseolus lunatus*) varieties as affected by different processing methods. *Nutr. Rep. Int.* 27(1); 1983; 41-9

Trypsin inhibitor activity (TI) was determined for 18 varieties of lima bean. The effects of soaking, germination, cooking and autoclaving on TI were also assessed. TI in the unprocessed samples ranged between 29.43 and 36.65 TUI/mg protein, being highest in TPL 13 and lowest in TPL 17. TI was completely eliminated by cooking in all varieties, while autoclaving gave a maximum total loss of 89.47% in TPL 17 and a minimum of 73.93% in TPL 13. Soaking for six days gave a mean total loss of 34.64%. Germination was most effective after the 4th day when TI ranged between 18.48 TUI/mg protein in TPL 9 and 26.90 TUI/mg protein in TPL 7. The highest total loss after six days was obtained in TPL 9 (63.84%) and the lowest in TPL 10 (39.91%). AA

WINGED BEAN

- 3757 NMORKA (GO) and OKEZIE (BO). Nutritional quality of winged bean composite breads. *Cereal Chem.* 60(3); 1983; 198-202

OILSEEDS AND NUTS

- 3758 VENKATESWARA RAO (Y), AZEEMODDIN (G), ATCHUTA RAMAYYA (D) and THIRUMALA RAO (SD). Bulk densities of oilseeds. *J. Food Sci. Technol. (India)* 20(2); 1983; 73-4

Data on bulk densities of different oilseeds and their products are given. Wide variations observed in the values are due to varietal and structural characteristics. AA

- 3759 JONES (LJ) and TUNG (MA). Functional properties of modified oilseed protein concentrates and isolates. *Can. Inst. Food Sci. Technol. J.* 16(1); 1983; 57-62

- 3760 SUSHEELAMMA (NS). Studies on lysine enriched plasteins from oilseed proteins. *J. Food Sci. Technol. (India)* 20(2); 1983; 47-51

Lysine enriched plasteins have been prepared from groundnut and sesame protein using N-E-cbz-lysine methyl ester and also enzymatic hydrolyzates of casein or soyabean protein as a source of lysine peptide. Plasteins obtained with N-E-cbz-lysine methyl ester had yields of around 40% for sesame and 70% for groundnut. Lysine content was 11-13% for groundnut and 16-19% for sesame plasteins. Those obtained with lysine peptides as a source of this amino acid had high yields (75-85%) and moderate lysine content (6-6.5% for groundnut and 7-9% for sesame plasteins). AA

COTTONSEED

- 3761 RAHMA (EH) and NARASINGA RAO (MS). Effect of acetylation and succinylation of cottonseed flour on its functional properties. *J. Agric. Food Chem.* 31(2); 1983; 352-5

Cottonseed proteins were acetylated or succinylated to different levels, and the nitrogen solubility in water or 5% NaCl solution, water absorption and oil absorption capacity, emulsification capacity, foam capacity and foam stability, bulk density, and *in vitro* digestibility of cottonseed flour were determined. Acetylation decreased the nitrogen solubility in water or 5% NaCl whereas succinylation increased it. The water absorption capacity did not change due to succinylation but increased due to acetylation. On the other hand, high levels of acetylation or succinylation decreased the oil absorption capacity. The emulsifying capacity increased initially on acylation and then decreased. Foam capacity increased but foam stability decreased on acylation. But density increased due to modification but *in vitro* digestibility was not affected. AA

- 3762 RAHMA (EH) and NARASINGA RAO (MS). Effect of limited proteolysis on the functional properties of cottonseed flour. *J. Agric. Food Chem.* 31(2); 1983; 356-8

Cottonseed flour was treated with a protease at different ratios of the enzyme to the protein, and the effect of proteolysis on nitrogen solubility in water and 5% NaCl solution, water absorption, oil absorption and emulsifying capacity, foam capacity, and foam stability and bulk density was determined. Nitrogen solubility in water increased nearly 4-fold. However, nitrogen solubility in 5% NaCl solution was not altered. Water absorption capacity decreased by about 30% but oil absorption capacity was not affected.

Emulsifying capacity increased by about 90% and foam capacity by about 40%. However, foam stability did not improve. Bulk density also increased due to proteolysis. AA

GROUNDNUT

- 3763 BALASUBRAMANYAM (N), BALDEVARAJ and INDIRAMMA (AR). Packaging and storage quality of roasted and salted, spiced peanuts in flexible packages. *Perceptac.* 23(1); 1983; 5-11

For crispness of roasted and salted-spiced peanuts at 27 C, a moisture content of 2.7% was found to be critical. Rancidification was higher when the moisture content fell below the calculated BET mono-layer level of 1.7%. In polyolefin and cellophane packages, the shelf-life was hardly 25 days and only 60-120 days in vacuum-packed, metallized polyester/poly/foil based pouches. A shelf-life of 180 days, under Standard Indian Conditions (65% RH, 27 C) could be attained only in vacuum-packed, polyester/poly/foil/poly-laminate pouches. The critical peroxide value - as regards acceptability - for this product appears to be 25-30 m.eq. O₂/kg of fat. Ultra-violet light and temperature greatly increase the rate of rancidification, and make the product unacceptable within a short time (20-60 days, depending on storage conditions). KMD

- 3764 JACKS (TJ), HENSARLING (TP), NEUCERE (NJ) and GRAVES (EE). Conformational stability and dissociation of a peanut storage protein (Arachin) exposed to organic solvents. *J. Agric. Food Chem.* 31(1); 1983; 10-14

Arachin (the major peanut storage protein) was exposed to hexane, acetone, hexane-acetone-water, and acidic hexane (mixtures of hexane and acetic acid), and its antigenicity, electrophoretic mobility, ultraviolet and infrared absorbances, and circular dichroism were examined. Samples exposed to hexane, acetone, and hexane-acetone-water were virtually identical with native arachin in these properties, indicating no effects of these solvents. Exposure to acidic hexane, however, resulted in loss of reactivity to anti-arachin and increased electrophoretic mobility in nondenaturing gels but no corresponding change of migrational pattern in dissociating sodium dodecyl sulphate gels and no changes in infrared and circular dichroic spectra. Results were interpreted as irreversible dissociation of arachin by acidic hexane into subunits, each of which maintained the native secondary structure of the multimeric form. Antigenic determinants embraced separate subunits and required quaternary structure for subsequent antibody reactivity. AA

- 3765 MBATA (GN) and OSUJI (FNC). Some aspects of the biology of *Plodia interpunctella* (Hubner) (Lepidoptera: Pyralidae), a pest of stored groundnuts in Nigeria. *J. Stored Prod. Res.* 19(3); 1983; 141-51

- 3766 ACTON (JC), WILLIAMS (WP), SCHNELL (S), WARDLAW (FB) and DICK (RL). Protein quality evaluation of drum-dried and dried-extruded peanut products. *Food Sci. + Technol.* 16(1); 1983; 5-7

Blanched peanuts splits had an *in vivo* PER of 1.43. Further processing by drum drying and fat removal (partial and complete) raised the *in vivo* PER to the high level of 1.91. But extrusion of a completely defatted peanut flake, to produce a textured granule, reduced the PER from 1.91 to 1.70. *In vitro* computer PER (C-PER) values ranged from 1.55 to 1.60, except for a decrease to a C-PER of 0.93 upon extrusion. *In vitro* digestibility values

were similar for most products (88.0 to 89.7%), except after complete fat extraction (86.4%) and extrusion (84.8%). Minor differences were noted in the amino acid composition of the product. Thus, the *in vitro* method for screening protein quality could detect the major effects of further processing, but could not differentiate minor effects in protein quality changes. KMD

- 3767 BELANI (RC) and PAI (JS). Solvent extraction of whole groundnuts. *J. Food. Sci. Technol. (India)* 20(2); 1983; 72-3

Oil was extracted from whole groundnuts using petroleum ether, Roasting for a short time at temperature between 160 and 250 C facilitated skin removal and also aided in extraction. Various extraction methods were tested. A combination of overnight soaking and a short extraction of 2 hours by refluxing was found to be ideal for maximum oil removal without cracking of the seeds. Solvent was removed from seeds by heating at 70-90 C for a few hours. Such groundnuts were whole, without cracks and possessed good colour, odour and texture. AA

MUSTARD

- 3768 HOLLEY (RA) and TIMBERS (GE). *Nematospora* destruction in mustard seed by microwave and moisture treatments. *Can. Inst. Food Sci. Technol. J.* 16(1); 1983; 68-75

Microwave treatment was used to successfully destroy contaminating yeast inside oriental mustard seed without affecting production of the pungent flavour principle of mustard, allylisothiocyanate. A 13s exposure to 2.450 MHz microwave energy was effective in eliminating the yeast at 87 C from seed containing 6.8% moisture. During the same treatment at 9.7% moisture, a temperature of only 71 C was lethal to the yeast. Seed moisture also affected the temperature at which endogenous myrosinase was inactivated. Myrosinase inactivation occurred over a temperature range at least 10 C higher than those at which the yeast were killed. Recovery experiments were complicated by the observation that yeast in both sublethally heated and in unheated, moisture-amended seed died upon storage. The duration of *Nematospora* survival in unheated low moisture seed stored at 24 C was estimated to be about 2.8 years, but in seed adjusted to contain almost 10% moisture, survival was predicted to be just under 140 days, and was measured at 65 days. The rate of yeast death was accelerated in moisture-amended seed by elevated temperature during storage. Mould growth at high seed moisture (>10%) was extensive during storage at 24 C. AA

- 3769 SINDHU KANYA (TC) and KANTHARAJ URS (M). Carbohydrate composition of mustard (*Brassica juncea*) seed meal. *J. Food Sci. Technol. (India)* 20(3); 1983; 124-6

The carbohydrates of brown mustard (*B. juncea*) were fractionated and estimated. Compared to rapeseed and turnip, rape, mustard seed contains significantly larger amounts of hemicelluloses, but lesser amount of pectic substances, hot water soluble polysaccharides and celluloses. The 80% aqueous ethanol soluble free sugars were separated and estimated by paper chromatography. Among free sugars, sucrose was considerably in lower amounts, whereas raffinose, glucose and fructose were more in mustard. AA

JOJOBA

- 3770 ANON. Report on jojoba - First harvest of cultivated plantations, bringing desert crop closer to widespread commercial use. *J. Am. Oil Chem. Soc.* 60(1); 1983; 45. A-58A

RAPESEED

- 3771 BLAICHER (FM), ELSTNER (F), STEIN (W) and MUKHERJEE (KD). Rapeseed protein isolates: Effect of processing on yield and composition of protein. *J. Agric. Food Chem.* 31(2); 1983; 358-62

Countercurrent extractions of defatted rapeseed meal, alternately at pH 9.5 and pH 12.0 in the successive stages, ensured highest dissolution of meal protein (92%) and phytic acid (70%). The resulting extract provided, upon consecutive precipitations at pH 6.0 and 3.6, two protein isolates containing ~60% and ~12%, respectively, of meal protein and distinctly different levels of phytic acid (9.8% and 4.3%, respectively). As much as ~70% of phytic acid, but only ~14% of protein, contained in the meal could be removed by extraction at pH 4.0. The resulting meal residue provided, upon extraction at pH 11.0 and subsequent precipitation of the protein from the extract at pH 4.7, a protein isolate containing only 0.2% phytic acid. The colour of the protein isolates could be considerably improved by the use of sodium bisulphite in the solvent for protein extraction. Rapeseed protein isolates containing about 10% phytic acid exhibited a protein efficiency ratio of 2.2, as compared to a value of 2.5 for casein. AA

SESAME

- 3772 REDDY (AS) and REDDY (SM). Elaboration of mycotoxins from fungi associated with til (*Sesamum indicum* L.). *Curr. Sci.* 52(12); 1983; 613-4

36 fungal species, were obtained from 105 samples of til seed and screened for toxigenic potential. The fungi comprised several species, of *Aspergillus*, *Fusarium* and *Penicillium citrinum* which were capable of elaborating a wide range of mycotoxins. MVG

SOYABEAN

- 3773 HSU (KH), KIM (CJ) and WILSON (LA). Factors affecting water uptake of soyabeans during soaking. *Cereal Chem.* 60(3); 1983; 208-11

Water uptake of soyabeans during soaking was determined by recording the weight increase in beans with respect to time. Temperature was found to influence the rate of water uptake, with higher rates associated with higher temperatures. Upto one percent sodium bicarbonate showed little effect on the rate of water absorption; however, a slower rate was observed at higher concentrations. The rate and maximum amount of absorption showed little correlation with the protein content, density, and size of the bean. Preextraction of beans with methanol increased the water-uptake rate of slow-absorbing beans. A diffusion model was used to describe the absorption of water by the soyabeans. Diffusivity was found to be dependent upon the water content in beans. AA

- 3774 FLEMING (SE) and REICHERT (RD). A comparison of the flatulence potential of field pea and soyabean seed fractions. *Can. Inst. Food Sci. Technol. J.* 16(1); 1983; 30-34

Low, medium and high protein field peas were pin milled and air classified to yield fractions rich in either protein or starch. These flours and their fractions were compared to a soyabean flour and protein concentrate for flatulence potential by quantifying hydrogen production from rats fed single doses of these seed components. The soyabean flour (57% protein) showed higher flatulence potential than the field pea protein concentrate (41-57% protein), but the differences were not statistically significant. The dry milling procedure did not fractionate the flatulence causing constituents of the field pea with either the starch or protein constituents. Consequently, the quantities of constituents thought to be fermentable, including dietary fibre and oligosaccharides, could not be related to the quantity of hydrogen produced. AA

- 3775 HONIG (DH), HOCKRIDGE (M), GOULD (RM) and RACKIS (JJ). Determination of cyanide in soyabeans and soyabean products. *J. Agric. Food Chem.* 31(2); 1983; 272-5

- 3776 HUGHES (SA) and MURPHY (PA). Varietal influence on the quantity of glycinin in soyabeans. *J. Agric. Food Chem.* 31(2); 1983; 376-9

- 3777 ELDRIDGE (AC) and KWOLEK (WF). Soyabean isoflavones: Effect of environment and variety on composition. *J. Agric. Food Chem.* 31(2); 1983; 394-6

The effects of environment and variety on the isoflavones and isoflavone glucosides of soyabeans were studied. Extracting the oil from soyabeans did not remove the isoflavones or the isoflavone glucosides since they are not soluble in hexane. The total isoflavone of soyabeans varied from 116 to 309 mg/g within variety and varied from 46 to 195 mg/g with the same variety grown in different locations. The isoflavones in soyabeans also varied from year to year when soyabeans were grown in the same location. On an equal weight basis most of the isoflavones are concentrated in the hypocotyl and the isoflavone content of soyabean hulls is quite low. AA

- 3778 WARNER (K), MOUNTS (TL), RACKIS (JJ) and WOLF (WJ). Relationships of sensory characteristics and gas chromatographic profiles of soyabean protein products. *Cereal Chem.* 60(2); 1983; 102-6

To survey the present state of soyprotein processing, commercial samples were evaluated for odour and flavour and analyzed by gas chromatography for volatile constituents and by microbiological procedures for molds, aerobic bacteria, and coliforms. Sensory tests showed flavour score ranges of 5.5-6.3 for flours, 4.4-5.9 for concentrates, 5.1-6.9 for isolates, and 5.3-6.7 for textured flours. Some objectionable flavour characteristics of raw soy were retained, and detrimental off-flavours were generated during processing. Major volatile constituents were residual solvents (ethanol and hexane) and hexanal. Significant statistical correlations exist between total volatiles and flavour scores of soy concentrates and isolates. Microbiological test results were typical of standard profiles. Direct gas chromatographic analysis was useful to screen soy products of known history for residual solvent and for content of volatile components related to oxidative deterioration. AA

- 3779 PHAM (CB) and DEL ROSARIO (RR). The preparation of protein hydrolysate from defatted coconut and soyabean meals. II. Quality and sensory evaluation of products. *J. Food Technol.* 18(2); 1983; 163-70
- Protein hydrolysate prepared from defatted soyabean meal and coconut meal using acid hydrolysis under different conditions were analysed and subjected to sensory evaluation. Analysis of amino acid after hydrolysis showed a 10.32% reduction in the soyabean product and a 31.93% reduction in coconut product. Chemical analyses showed similarities in pH, viscosity, salt content and reducing sugar between the hydrolysates and the commercial soy sauce sample. Both amino and total nitrogen and acidity were higher in the hydrolysate than the commercial sample. Sensory evaluation showed that hydrolysed soyabean products gave better scores in terms of colour, aroma, flavour and general acceptability than coconut products. Addition of soyabean to coconut meal resulted in improved hydrolysed product. AA
- 3780 GABR (M), MARAGHI (S) and MORSI (S). Management of lactose intolerance secondary to protein calorie malnutrition with soy-based, lactose-free formula. *Nutr. Rep. Int.* 27(1); 1983; 51-8
- A soy-based lactose-free formula is found to be a suitable feeding for lactose intolerant infants recovering from protein caloric malnutrition. KAR
- 3781 MATTHEW (JA) and CHAN (HW-S). Soyabean lipooxygenase-I catalysed exchange of molecular oxygen in 13-S-hydroperoxy-9-cis, 11-trans octadecadienoic acid. *J. Food Biochem.* 7(1); 1983; 1-6
- 3782 AKOLKAR (PN) and PAREKH (LJ). Nutritive value of soy idli. *J. Food Sci. Technol.* (India). 20(1); 1983; 1-4
- Idli was prepared using rice flour, soydal flour and common salt. Nutritive value of idli was assessed by feeding weaning albino rats with fermented/unfermented idlis supplemented with lime powder and fenugreek leaves. Fermented soy idli was found superior to unfermented soy idli in terms of body weight gain, hepatic protein and femur composition. Lime and fenugreek further improved the growth.
- 3783 WANG (HL), SWAIN (EW), KWOLEK (WF) and FEHR (WR). Effect of soyabean varieties on the yield and quality of tofu. *Cereal Chem.* 60(3); 1983; 245-8

TUBERS AND VEGETABLES

- 3784 SUZUKI (K), KANKE (Y), GOTO (S) and KONDO (N). The effect of root crops on nitrogen, calcium, phosphorus and magnesium utilization. *Nutr. Rep. Int.* 27(1); 1983; 213-20
- The influence of cassava, taro, sweet potato on protein and mineral utilization was investigated with rats. Taro root and sweet potato fed group showed the higher weight gain and fecal weight as compared to other tubers, but in the former it was only apparent weight gain. Cassava fed group showed the higher nitrogen utilization than taro root and sweet potato fed group. KAR
- 3785 HUANG (YT) and BOURNE (MC). Kinetics of thermal softening of vegetables. *J. Texture Stud.* 14(1); 1983; 1-9

The rate of softening in several canned vegetables during the retort process was studied. The rate of softening is consistent with two simultaneous first order kinetic mechanisms; mechanism 1 acting on substrate "a" and mechanism 2 acting on substrate "b". The rate constants for mechanism 1 are 20 times or more greater than the rate constants for mechanism 2. Approximately 85% to 97% of the firmness of the raw commodity is contributed by substrate "a" and the remaining firmness is contributed by substrate "b". Mechanism 1 is probably due to pectic changes in the interlamellar layer. The biochemical nature of substrate 2 is a matter of speculation. The apparent Arrhenius activation energies range from 5.1 to 35.0 Kcal/mole. The data indicates that softening kinetics of vegetables is more complex than has been formerly assumed. AA

- 3786 SPLITTSTOESSER (DF). Indicator organisms on frozen blanched vegetables. *Food Technol.* 37(6); 1983; 105-6

Fecal coliforms in frozen blanched vegetables, and their comparison to ICMSF recommendation have been made. KAR

- 3787 SONOBE (H), CARVER (RA), KRAUSE (RT) and KAMPS (LR). Extraction of biologically incorporated (^{14}C) carbofuran residues from root crops. *J. Agric. Food Chem.* 31(1); 1983; 96-104

CARROT

- 3788 ROUCHAUD (J), MOONS (C) and MEYER (JA). Effects of selected insecticides and herbicides on free sugar contents of carrots. *J. Agric. Food Chem.* 31(2); 1983; 206-10

POTATO

- 3789 MAZZA (G), HUNG (J) and DENCH (MJ). Processing/nutritional quality changes in potato tubers during growth and long term storage. *Can. Inst. Food Sci. Technol. J.* 16(1); 1983; 39-44

Changes in sucrose, reducing sugars, ascorbic acid, protein and nonprotein nitrogen contents and chip/French fry colour of Alberta commercially grown and stored Kennebec and Norchip, both potato chippers, and Russet Burbank, a French fry cultivar, were studied. Sucrose concentration of tubers was high during early stages of growth, decreasing rapidly with later dates of sampling, and reaching a minimum at maturity. Growth location and season, and storage site and temperature had little effect on the sucrose content. However, early harvested Norchip always had the least amount of sucrose. Ascorbic acid content increased with growth and maturity of the tuber, but steadily decreased by storage. True and crude proteins increased only slightly with maturity and storage. Russet Burbank had the lowest crude protein, but the highest dry matter content. Correlation analysis of the chip colour, dry matter, sucrose, reducing sugars, ascorbic acid, protein and storage temperature data showed that while dry matter, reducing sugars, and sucrose were significant in determining chip colour of freshly harvested potatoes, reducing sugars, tuber temperature and sucrose were important in determining chip colour of stored tubers. The relative importance of each parameter varied with cultivar and age of the tubers. AA

- 3790 JOHNSTON (DE), KELLY (D) and DORRIAN (PP). Losses of pectic substances during cooking and the effect of water hardness. *J. Sci. Food Agric.* 34(7); 1983; 733-6

The pectic substance content of (g/100 g dry matter) potatoes was 2.98 for raw peeled tubers, 0.97 after boiling for 35 minutes, 1.22 after steaming for 35 minutes and 1.24 after pressure cooking at 103.4 kPa for 15 minutes. Water hardness did not influence losses during pressure cooking but samples boiled in hard water had decreased losses of pectic substances compared to those boiled in soft water. KAR

- 3791 MEUSER (F) and KOHLER (F). Energy saving by membrane filtration of process water of potato and wheat starch plants. *Food Chem.* 10(1); 1983; 1-13

The results reported here are a first estimation of the energy required by various processes to reduce the COD of effluent from potato and wheat starch plants by recovering the dissolved material. It is clearly shown that membrane filtration can help to minimise the total primary energy input by recovering otherwise wasted substances. With respect to the energy subsidy, most favourable results can be obtained with 60% and 90% COD reduction using coagulation, as well as membrane filtration (hyperfiltration), combined with evaporation, as process stages. According to the energy subsidy ratios, the procedures waste no primary energy and have the advantage of increasing the dry substance yield from the processed raw material. AA

- 3792 HERNANDEZ-BRIZ (S) and CLOTET BALLUS (R). A test for pro-oxidants in printed packaging films. *J. Food Technol.* 18(2); 1983; 251-3

It has been found that chip potatoes and extruded fried snacks, packaged in polypropylene film with outside print developed deterioration by fat oxidation in a short period of time of about 10 days at 20 C, 75% r.h. A simple analytical method has been developed that can provide rapid information about all pro-oxidant interactions specific to the packaging material and the oil or fat used in the process. AA

- 3793 RAGAB (MT), EVERETT (CF) and DeMARCO (AC). Analysis of potatoes treated with dinoseb and chlorbromuron herbicides. *J. Agric. Food Chem.* 31(2); 1983; 449-51

- 3794 SCHOORL (D) and HOLT (JE). Cracking in potatoes. *J. Texture Stud.* 14(1); 1983; 61-70

Cracking in two varieties of potatoes was investigated by compressing whole tubers between flat plates at low compression rates. It was found that resulting crack areas correlated directly with the energy stored at cracking. Of the energy imparted to the tuber, a large proportion is dissipated during compression. Cracking occurs when the stored energy exceeds a critical value, approximately 1.6 J for Sebago and 0.9 J for Pontiac. The extent of cracking is determined by the fracture toughness, calculated to be 1350 Jm⁻² for Sebago and 1230 Jm⁻² for Pontiac. The Sebago variety is thus more resistant to cracking than Pontiac. The energy dissipative mechanisms in hysteresis and crack propagation are explained in terms of the structure of potato tissue. AA

TAPIOCA

- 3795 PREMAKUMARI (K) and KURUP (PA). Effect of feeding cooked tapioca as compared to rice on the metabolism of glycosaminoglycans in rats. *Indian J. Biochem. Biophys.* 20(3); 1983; 163-6

Earlier findings of the authors indicated that tapioca reduced cholesterol and triglycerides in serum, contradicting the general belief that use of tapioca might lead to cardiovascular disease. As it is known that metabolism of glycosaminoglycans (G/g) is also deranged in cardiovascular diseases and there are reports of atherosclerosis even with normal serum cholesterol, the concentration of different G/g in some tissues particularly aorta and activities of enzymes involved in the biosynthesis of precursors of G/g, degradation of G/g and sulphatation were studied in rats fed tapioca and compared to those fed rice. In rats fed tapioca as compared to those fed rice, there was a decrease in the concentration of many G/g in aorta and other tissues. Activity of glucosamine phosphate isomerase (glutamine forming) and UDPG dehydrogenase showed decrease while the pattern of change in the activity of enzymes concerned with G/g degradation was not uniform. There was also an increase in PAPS concentration and activity of sulphate activating system (sulphate adenyl transferase and adenyl sulphate kinase) in the liver. The effect of tapioca on G/g levels in the tissues was attributed possibly to nature of tapioca starch containing more amylopectin, nature and quantity of fiber and presence of some unknown substance(s), unremoved on cooking, but affecting the metabolism of G/g. MVG

- 3796 EMILIA ABRAHAM (T), RAJA (KCM), MANOHARAN (EP) and MATHEW (AG). Effect of heat-moisture treatment on textural characteristics of cassava flour. *Cereal Chem.* 60(1); 1983; 7-8

After conditioning, plain and parboiled flours were subjected to open-pan roasting and pressure steaming. Viscosity and textural characteristics of the samples were then compared. Texture improved significantly only in the parboiled flour, which was open-pan roasted after the moisture level was adjusted to $28 \pm 2\%$. A comparative study of plain and parboiled dry cassava cubes showed that compressive strength increased 10 times more in the parboiled cubes than in the plain cubes. AA

ALFALFA

- 3797 KAMI (T). Composition of the essential oil of alfalfa. *J. Agric. Food Chem.* 31(1); 1983; 38-41

- 3798 MALIWAL (BP). *In vitro* methods to assess the nutritive value of leaf protein concentrate. *J. Agric. Food Chem.* 31(2); 1983; 315-9

Leaf protein concentrate (LPC) from nine vegetations was analyzed for *in vitro* digestibility and amino acid composition by chemical methods. These LPCs were also assessed in animal experiments for true digestibility and net protein ratio (NPR). There were marked differences among the LPCs in amino acid composition (available lysine, sulphur amino acids, histidine, and tryptophan), pepsin and pepsin-pancreatin digestibility, and the food intake, growth, and digestibility in the animal experiments. There were good correlations between *in vitro* and *in vivo* digestibility, between sulphur amino acids and NPR, and among the changes in various amino acids and available lysine. Pepsin-pancreatin digestibility, available lysine, and the contents of sulphur amino acids promise to be a sensitive and rapid *in vitro* measure of the nutritive value of LPC. AA

- 3799 GUSTAFSSON (KH) and FAHLGREN (CH). Determination of dithiocarbamate fungicides in vegetable foodstuffs by high-performance liquid chromatography. *J. Agric. Food Chem.* 31(2); 1983; 461-3

- 3800 ABO BAKR (TM), MOHAMED (MS) and MOUSTAFA (EK). Evaluation of leaf protein isolates of some Egyptian crops. *Food Chem.* 10(1); 1983; 15-23

The *in vitro* digestibilities by pepsin, pancreatin and pepsin followed by pancreatin of the leaf protein isolates of four species of Egyptian crops were studied. Bean and cabbage leaf protein isolates were more digestible with pepsin and pancreatin, each used individually, as well as with pepsin followed by pancreatin, than those of tomato and sugar cane. There were only minor variations in the amino acids content of the different leaf protein isolates with the sulphur-containing amino acids being the limiting acids. Bean and cabbage leaf protein isolates were superior to those of tomato and sugar cane from the point of view of availability of amino acids. AA

PARSLEY

- 3801 VERNON (F) and RICHARD (HMJ). Study of volatile constituents of curly parsley (*Petroselinum hortense* Hoff) leaves essential oil. *Food Sci. + Technol.* 16(1); 1983; 32-5 (French)

The study of curly parsley essential oil *Petroselinum hortense* Hoff has shown 32 volatile constituents: 21 hydrocarbons, most of them are monoterpenes; 2 ethers, myristicin and apiole; 3 monoterpene alcohols; 4 monoterpene aldehydes; 2 Ketones. Three constituents represent around 80% of the total essential oil: p 1-3-3 menthatriene (50%), β -phellandrene (13,3%) and myristicin (17.2%); they are not characteristics of the parsley flavour. AA

CAULIFLOWER

- 3802 MARTENS (M), MARTENS (H) and WOLD (S). Preference of cauliflower related to sensory descriptive variables by partial least squares (PLS) regression. *J. Sci. Food Agric.* 34(7); 1983; 715-24

TOMATO

- 3803 BURET (M), GORMLEY (R) and ROUCOUX (P). Analysis of tomato fruit: Effect of frozen storage on compositional values - An inter-laboratory study. *J. Sci. Food Agric.* 34(7); 1983; 755-60

Tests for soluble solids, dry matter content, electrical conductivity, titratable acidity, potassium, pH, glucose, fructose, sucrose, total N and vitamin C in frozen tomatoes indicated that the levels of most of these constituents remained relatively constant during frozen storage and were similar to values found in the fruit prior to freezing. KAR

- 3804 GULERIA (SPS), VASUDEVAN (P), MADHOK (KL) and PATWARDHAN (SV). Use of tomato seed powder as an antioxidant in butter and ghee. *J. Food Sci. Technol.* (India) 20(2); 1983; 79-80

Tomato seed powder was added to white butter and ghee separately at 1, 3 and 5% levels and the peroxide value was recorded during drying in an oven for 36 hours. Addition of tomato powder at 5% has the same effect in preventing oxidation, as that of butylated hydroxytoluene or butylated hydroxyanisole used at 0.01% level. KAR

BITTER GOURD

- 3805 YADAV (GS) and KATHPAL (TS). Extent of fenitrothion residues in bitter-gourd fruits. *Indian J. Agric. Sci.* 53(6); 1983; 463-6

Bitter gourd (*Momordica charantia* Linn.) sprayed at 10 day intervals with 0.05% fenitrothion for controlling *Dacus cucurbitae* Coq. was evaluated for residues at different stages after treatment. On the day of application, the residues were above the maximum limit of 0.3 ppm, but reached below the limit within 3 days. Within 7 to 10 days they reduced below detectable levels. Washing and peeling the fruit was not effective in reducing the residues as the water-insoluble insecticide penetrated into the deeper layers of the fruit. MVG

FRUITS

- 3806 KAPUR (OP) and NAGARAJ (KV). Quality evaluation of export oriented processed fruit and vegetable products. *Indian Food Packer.* 37(1); 1983; 94-8

The observations recorded regarding the quality evaluation of export oriented processed fruit and vegetable products (1981-82 and 1982-83 (April 82-Jan. 83) have been analysed to provide guidelines for the manufacturers of the products to step up their quality standards. BSN

- 3807 MUDAHAR (GS) and BHATIA (BS). Steeping preservation of fruits. *J. Food Sci. Technol. (India)* 20(2); 1983; 77-9

Fruits like peach, plum, nectrine, grape, guava, banana, pear and pineapple were preserved in steeping solution having 30% sugar, 0.4% acidity and 400 ppm of SO₂ in glass jars. The fruits were analysed for soluble solids, acidity, and ascorbic acid when fresh and at the end of steeping preservation. When analysed after 4 months, the acidity decreased in all fruits except in banana; the ascorbic acid also decreased in all fruits. The residual SO₂ in fruits ranged from 35 to 65 ppm. No colour change was observed in peach, guava, pear and pineapple. The red colour of plum, nectrine and grapes was reduced appreciably. The skin of plum, nectrine and peach loosened slightly, resulting in soft texture of the fruit. All the fruits except plum and nectrine were found acceptable after 4 months steeping. KAR

- 3808 SHAW (GJ), ELLINGHAM (PJ) and BIRCH (EJ). Volatile constituents of Feijoa-headspace, analysis of intact fruit. *J. Sci. Food Agric.* 34(7); 1983; 743-7

- 3809 TEBBETS (JS), HARTSELL (PL), NELSON (HD) and TEBBETS (JC). Methyl bromide fumigation of tree fruits for control of the mediterranean fruit fly: Concentrations, sorption and residues. *J. Agric. Food Chem.* 31(2); 1983 247-9

- 3810 MOYE (HA), MILES (CJ) and SCHERER (SJ). A simplified high-performance liquid chromatographic residue procedure for the determination of glyphosate herbicide and (Aminomethyl) phosphonic acid in fruits and vegetables employing postcolumn fluorogenic labelling. *J. Agric. Food Chem.* 31(1); 1983; 69-72

- 3811 SILGE (MR) and CALLON (S). Fruit and nut ingredients for snack foods. *Cereal Food World*. 28(5); 1983; 286-9

Aspects covered include: new snack trends; use of figs and prunes and blending of fruits, raisins, walnuts, hazelnuts, and nutritional values of dried fruits and nuts. KAR

GRAPE

- 3812 ROMEYER (FM), MACHEIX (JJ), GOIFFON (JP), REMINIAC (CC) and SAPIS (JC). The browning capacity of grapes. 3. Changes and importance of hydroxycinnamic acid-tartaric acid esters during development and maturation of the fruit. *J. Agric. Food Chem.* 31(2); 1983; 346-9

BANANA

- 3813 NEW (S) and MARRIOTT (J). Factors affecting the development of 'finger drop' in bananas after ripening. *J. Food Technol.* 18(2); 1983; 241-50

A simple mechanical method has been developed to measure the force required to break banana fruit peel in the region of the pedicel. Values obtained for peel breaking force correlate well with measured differences in susceptibility to 'finger drop'. Longer periods for fruit ripening, obtained by a reduction of the conventional ripening temperature, favour maintenance of a high peel breaking force and extend the shelf life of ripe fruit but reduce the degree of colouration. Finger drop in bananas of tetraploid clones, which are highly susceptible to its development, could be minimized by ripening at temperatures about 2 C lower than those optimal for 'Valery', a major commercial triploid cultivar. The peel breaking forces of different tetraploid clones were compared under controlled ripening and shelf life conditions and several clones with significantly reduced susceptibilities to finger drop were identified. Clones with a low susceptibility to finger drop were generally also characterized by a long pre-climacteric period. AA

- 3814 PAUL THOMAS, PUSHPA PAUL, NAGARAJA (N) and DALAL (VB). Physico-chemical and respiratory changes in Dwarf Cavendish variety of bananas during growth and maturation. *J. Food Sci. Technol. (India)* 20(2); 1983; 51-6

'Dwarf Cavendish' bananas exhibited a concave growth curve and took 130 days to reach full maturity after the inflorescence emergence. Pulp to skin ratio increased from an initial value of 0.25: 1.0 to 1.9: 1.0 at full maturity. Fruit weight increase was maximum during the final 4 weeks of growth. Dry matter and starch content in the pulp increased consistently upto 100 days of growth after which there was negligible change in starch, whereas dry matter content decreased. Skin tissues showed less marked changes in dry matter starch. Soluble sugars in pulp and skin remained at low level during growth. Titratable acids, ascorbic acid and N in the pulp tended to increase from 43 day onwards, while in the skin no perceptible changes were noticed throughout the growth period. Total phenols, flavonols and leucoanthocyanidin content showed a continuous fall as the fruit matured. Fruit respiration was maximum at the early stages of development, fell rapidly thereafter and remained steady during the later stages of maturation. Results indicate that the biochemical status of bananas does not change appreciably during the final stages of maturation and, therefore, a combination of chronological age and pulp to skin ratio could be used as an index of maturity at harvest. AA

CITRUS

- 3815 CALL (HP) and EMEIS (CC). Blue pectin: A new substrate for determining pectinolytic activity. *J. Food Biochem.* 7(1); 1983; 43-52

A new method of determining pectinolytic activities was developed with the aid of dye-substituted substrate. Soluble stained pectic acid proved to be the most suitable substrate for the agar diffusion, the cup-plate and the inoculation test, especially for screening purposes. Insoluble stained pectic acid was used as an enzyme substrate in the photometric test. The sensitivity of the method of 2×10^{-2} μmol of reducing groups liberated per minute per ml of enzyme may be considered satisfactory. AA

- 3816 RAVINDRANATH (B). Some useful products from Limonene: A byproduct of the citrus industry. *J. Sci. Ind. Res.* 42(2); 1983; 82-6

Some of the strategies of utilising d-limonene, a major byproduct of the citrus industry, as a raw material for the production of a variety of flavour and perfumery chemicals are discussed. Various methods for the conversion of limonene into α -terpineol, 1-menthanol, 4-terpinenol, carveol and their esters are described. A zinc salt assisted solvolytic reaction which was developed during this investigation could be applied to several related organic synthetic processes in the laboratory and in the industry. MVG

- 3817 MOSHONAS (MG) and SHAW (PE). Composition of aqueous essence and essence oil from citrus temple. *J. Agric. Food Chem.* 31(2); 1983; 334-6

GRAPEFRUIT

- 3818 MOYE (HA), BROOKS (RF) and SCHERER (SJ). Residues of phenthoate (Cidial) and its oxon on grapefruit, lemons, oranges, their fractionated products, and soil. *J. Agric. Food Chem.* 31(1); 1983; 122-7

An analytical procedure for the analysis of phenthoate insecticide (O,O-dimethyl S-(α -carboethoxybenzyl) phosphorodithioate, Cidial) and its oxon is described for fresh grapefruit, lemons, and oranges as well as for 15 fractionated products and soil. The phenthoate, in the form of an emulsifiable concentrate (Cidial), was applied to the citrus trees at 4 and 8 oz of active ingredient/100 gal. Fresh fruit and soil exhibited typical first-order decay for phenthoate, with levels after 7 days in peel below 1 ppm; pulp levels never exceeded 0.04 ppm (orange, 7 days). Maximum phenthoate soil levels occurred at the tree drip line near the surface (0.55 ppm) but decayed to 0.12 ppm after 28 days; maximum oxon occurred at 14 days for these samples (0.04 ppm). Lemon peel oil, resulting from the 8-oz/100 gal treatment, incurred the highest phenthoate residues (16 ppm) as well as oxon (2.2 ppm). Wash water (after-water rinse) contained negligible residues of phenthoate and oxon. AA

MANGO

- 3819 KHEDKAR (DM) and SUSANTA ROY (K). Absorption and retention of sulphur dioxide in raw mango slices during drying and dehydration. *J. Food Sci. Technol. (India)* 20(1); 1983; 38-39

Mango slices were treated with potassium metabisulphite (KMS) for preserving it to prepare chutney. Raw mango slices after blanching were treated with 1.0, 2.0, 3.0, and 4.0% KMS solution for 15 and 30 minutes and dried in sun and in cabinet drier at 57 ± 5 C to 6% moisture level. The amount of SO_2 absorbed and retained was directly proportional to the concentration of KMS solution and the time of steeping. It is concluded that to get 2000 ppm of SO_2 , mango slices should be treated for 30 minutes in 3% KMS for sun drying and <2% KMS for cabinet drying. MVG

- 3820 RADHAKRISHNAIAH SETTY (G) and PATWARDHAN (MV). Energy conservation in the processing of canned mango pulp. *Indian Food Packer*. 37(1); 1983; 91-3

Preliminary studies were conducted at laboratory and factory levels to study conservation of energy in canning of mango pulp. The results have revealed that A 10 cans may be filled with hot mango pulp at 85-90 C and sealed; then inverted to sterilize the lid and then may be cooled, thereby eliminating the processing of cans at 100 C for 45-60 minutes. This will reduce steam consumption and aid increased production without affecting the quality of the canned mango pulp. BSN

- 3821 LAKSHMINARAYANA(G), CHANDRASEKARA RAO (T), and RAMALINGASWAMY (P). Varietal variations in content, characteristics and composition of mango seeds and fat. *J. Am. Oil Chem. Soc.* 60(1); 1983; 88-9

- 3822 SHANTA KRISHNA MURTHY and GOPALAKRISHNA RAO (KP). Post harvest control of spoilage in mango (*Mangifera indica* L.) with hot water and fungicides. *J. Food Sci. Technol. (India)* 20(2); 1983; 74-7

4 fungicides (Benlate, Thaibendazole, Captan, and Rovral) each at 500 ppm concentration in cold (28 C) and hot (52 C) water were tried for spoilage control in Alphonso and Totapuri variety of mangoes. Benlate in cold water reduced the spoilage in Alphonso for 12 days in storage and also retarded ripening. However, hot water dip for 5 minutes did not show any additional benefit with any of the fungicides. Captan and Thiabendazole proved next best, where as Rovral was not effective in controlling spoilage in Alphonso. In Totapuri, no fungicide was effective in controlling spoilage. KAR

APPLE

- 3823 CONWAY (J), CASTAIGNE (F), PICARD (G) and VOVAN (X). Mass transfer considerations in the osmotic dehydration of apples. *Can. Inst. Food Sci. Technol. J.* 16(1); 1983; 25-9

The osmotic dehydration of apples using a circulation system is described in terms of mass transfer concepts, where the parameters investigated were the loss of water and the gain of sugar. It was found that the loss of water was influenced by the temperature and the °Brix of the osmotic agent. The sugar gain reached a maximum after 30 minutes dehydration time and remained constant for the rest of the processing time. A mathematical model for this phenomena was proposed and it was found to correlate highly with the experimental data. The apparent diffusion coefficient D was evaluated and multilinear analysis revealed that D depended on temperature and °Brix in addition to a combined effect of both parameters. AA

- 3824 SHAH (GH) and BHATIA (BS). Studies on the processing of culled apples. *J. Food Sci. Technol. (India)* 20(3); 1983; 101-4

Two mid-season (Kesri and Red Delicious) and two late maturing (American and Maharaji) variety of apples were selected for preparing acceptable juice, jam and jelly from cull fruits. Products stored at ambient temperature and at 37 C were acceptable even after a storage period of 8 months. Juice from under-ripe Red Delicious after adjusting sugar/acid ratio had maximum consumer's acceptance. Blending of Maharaji and American for juice making in the ratio of 1:1 was rated superior to Maharaji and Red Delicious blend near the stage of maturity. Jelly failed to set without the addition of pectin. Maharaji and American blend in the ratio of 1:1 resulted in superior quality apple jelly after adding 0.5% pectin. Reducing sugars increased and pectin content decreased during storage. AA

- 3825 OGBADU (GH) and EHLERMANN (DAE). On the evaluation of internal browning of apples by electrical measurements. *Food Sci. + Technol.* 16(1); 1983; 15-7

Apples, of the variety Cox Orange, were stored at 3.5 C and 90% RH. The frequency of internal browning was found to be related to firmness and also to some chemical indices e.g. titratable acidity (as malic acid). The electric resistance increased during the initial period of storage, and a climax occurred before internal browning was observed. Thus, the change from increase to decrease in the electrical resistance of apple tissue might serve as an early indication of internal browning. These findings need further confirmation for the variety Cox Orange, and other varieties also. KMD

- 3826 ANANTHAKRISHNA (SM), DHANARAJ (S), RAMAKRISHNARAJAN (MG) and GOVINDARAJAN (VS). Instrumental quality measures: development, standardization and their correlation to the sensory attributes in apple. *J. Food Sci. Technol.* (India) 20(2); 1983; 57-62

Instrumental measures to assess 'Red Delicious' apple quality have been developed and standardized using Ottawa Texture Measuring System (OTMS). The OTMS yield point reflecting texture and OTMS juice volume area reflecting juiciness could be obtained simultaneously in one operation and were well defined to assess quality of apples at different stages of ripening during storage and could be used as indices of apple quality. Any abnormal variations in ripening could be detected if both these instrumental parameters are used. A correlation matrix is worked out between all combinations of instrumental and sensory quality factors studied and their significance is discussed. The OTMS yield point and juice volume area showed highly significant correlation with sensory texture and juiciness respectively. KAR

- ✓3827 FRIEDRICH (J), CIMERMAN (A) and PERDIH (A). The use of *Aspergillus niger* for bioconversion of apple distillery waste. *European J. Appl. Microbiol. Biotechnol.* 17(4); 1983; 243-7+

By growing *Aspergillus niger* on apple slot, the following results were obtained: filtration time was shortened by 30 times, reduction of the chemical oxygen demand in the liquid phase in the range of 50-80% depending upon the substrate dilution and a dry filter cake enriched with fungal biomass to about 12 g/l containing up to 22% raw proteins and certain amounts of cellulolytic enzymes in the filtrate. The influence of the initial pH, the salt addition and the dilution of the substrate were studied as well. KAR

PEAR

- 3828 SAWAYA (WN), KHATCHADOURIAN (HA), SAFI (WM) and AL-MUHAMMAD (HM). Chemical characterization of prickly pear pulp, *Opuntia ficus-indica*, and the manufacturing of prickly pear jam. *J. Food Technol.* 18(2); 1983; 183-93

PAPAYA

- 3829 ARYA (SS), NATESAN (V) and VIJAYARAGHAVAN (PK). Stability of carotenoids in freeze dried papaya (*Carica papaya*). *J. Food Technol.* 18(2); 1983; 177-81

Effect of water activity (a_w) and storage temperature on the degradation of carotenoids in relation to keeping quality of freeze dried papaya is reported. Carotenoids were found to be most stable at 0.33 a_w , and both below and above this level their rate of destruction was higher. Above 0.40 a_w browning limited the storage life. Freeze dried papaya has maximum stability between 0.22-0.33 a_w . AA

GUAVA

- 3830 TANDON (DK), KALRA (SK), KULKARNI (JK) and CHADHA (KL). Chemical and microbiological evaluation of stored guava pulp in PVC containers. *J. Food Sci. Technol. (India)* 20(3); 1983; 118-20

Guava pulp from two cultivars was stored at 26-30 C (RT) for 60 days in 5 kg PVC containers with 500, 750 and 1000 ppm of added SO_2 . The pulp was analysed at 15 day intervals for soluble solids, titratable acidity, pH, ascorbic acid, free SO_2 , tannins and reducing sugars. During storage, reducing sugars increased and vitamin C, tannins and free SO_2 were reduced. The fungi detected are *Aspergillus niger*, *Alternaria* sp., *Candida* sp., *Helminthosporium* sp., and *Saccharomyces* sp., It was found that 500 ppm of SO_2 is sufficient to check the deterioration upto 60 days. The juice prepared from the stored pulp was of good quality. KAR

- 3831 DHINGRA (MK), GUPTA (OP) and CHUNDAWAT (BS). Studies on pectin yield and quality of some guava cultivars in relation to cropping season and fruit maturity. *J. Food Sci. Technol. (India)* 20(1); 1983; 10-13

5 guava cv. ('Banarasi Surkha', 'Allahabad Safeda', 'Tehsildar', 'Apple Colour' and 'Sardar') were evaluated for pectin content as affected by the cropping season (rainy and winter) and stage of fruit maturity, (green mature, unripe and half ripe). Significantly higher amounts of crude pectin and jelly units were observed in winter season fruits but the pectin quality in terms of methoxyl content, anhydrogalacturonic acid content, degree of esterification and jelly grade was better in rainy season fruits. Although stage of fruit maturity had no marked effect, yet half ripe fruits yielded more jelly units than unripe ones. 'Banarasi Surkha' and 'Sardar' yielded high grade pectin, but higher number of jelly units were obtained from 'Sardar' and 'Apple Colour'. KAR

CARAMBOLA

- 3832 WILSON (CW) III, SHAW (PE) and KNIGHT (RJ). Analysis of oxalic acid in carambola (*Averrhoa carambola* L.) and spinach by high performance liquid chromatography. *J. Agric. Food Chem.* 30(6); 1982; 1106-8

SUGAR, STARCH AND CONFECTIONERY

- 3833 DAHIYS (DS) and VIMAL (OP). Utilization of distillery effluents (status of information). *Indian Sugar.* 32(12); 1983; 889-903

A descriptive bibliography on distillery effluent utilisation is given. The need for study of an integrated programme based on by-products recovery to provide fuel and water for distilleries, feed for animals and potash for soils, is emphasised. The on-going projects in different laboratories in India on distillery effluent utilization have been outlined. MVG

SUGAR

- 3834 HAEFELI (RJ). Comparative investigations on the taste thresholds of sugars and sugar substitutes in humans. *Food Sci. + Technol.* 16(1); 1983; 48-50

Data of sweetness of five sugars and six sugar alcohols were ascertained in man. These data permit a better evaluation of the sweetness of the sugar alcohols used as sucrose substitutes. Xylitol has the maximum sweetness of the sugar alcohols investigated. Dulcitol, sorbitol, mannitol and ribitol show approximately $\frac{1}{4}$ less sweetness than xylitol. However, dulcitol is not so easily soluble in water. The sweetness of D-arabitol is relatively small. Of the sugar alcohols investigated for their sweetness, in addition to xylitol, only sorbitol, mannitol and ribitol can be considered as valid substitutes for sucrose. AA

- 3835 SHINDE (BN), MARATHE (AB), JAVALEKAR (DV) and KADAM (SK). Effect of form and colour of polythene-the wrapping material on keeping quality of jaggery during storage. *Indian Sugar.* 32(12); 1983; 937-40

Wrapping of jaggery (crude brown sugar) with polythene film of any form or colour prevented moisture absorption, inversion of non-reducing sugar and liquification (running off). However, colourless polythene resulted in deterioration of jaggery colour during storage unless covered with dry grass from outside. Black polythene and jute cloth-lined polythene (black or white) markedly reduced the colour deterioration as well as moisture absorption and running off during storage. MVG.

STARCH

- 3836 WESELAKE (RJ) and HILL (RD). Inhibition of alpha-amylase-catalyzed starch granule hydrolysis by cycloheptaamylose. *Cereal Chem.* 60(2); 1983; 98-101

- 3837 ROBIN (SP). Study of β -limit dextrans from various native starches. Interpretation in term of amylopectin structure. *Sci. Aliment.* 1(4); 1981; 551-67 (French)

BAKERY PRODUCTS

- 3838 MATHASON (I). Analytical evaluation of baking quality. *Cereal Food World*. 28(4); 1983; 247-8

The use of fluorometer to provide a performance profile of a given lot of flour is described. The various aspects dealt with include, application of fluorometer for hard wheat flour, curve of fluorometer values, soft-wheat measurement and application and possible rationale for reactions involved in fluorometer analysis. KAR

BREAD

- 3839 MONSIVAIS (M), HOSENEY (RC) and FINNEY (KF). The Pelshenke test and its value in estimating bread-making properties of hard winter wheats. *Cereal Chem*. 60(1); 1983; 51-5

- 3840 FARIDI (HA) and RUBENTHALER (GL). Experimental baking techniques for evaluating Pacific Northwest wheats in North African breads. *Cereal Chem*. 60(1); 1983; 74-9

- 3841 THOMPSON (LU) and BAKER (LM). Influence of succinylated whey protein concentrate on farinograph characteristics and bread quality. *Cereal Chem*. 60(1); 1983; 71-3

When added to wheat flour, succinylated whey protein concentrates (SWC) decreased dough development time and stability compared with the addition of nonfat dry milk or whey concentrate. Lower volume, tenderness and acceptability, and lighter crust colour of breads with SWC were also observed. Despite its high water-holding capacity, SWC did not effectively prevent the staling of bread. Addition of sodium stearyl-2-lactylate did not significantly improve the effects of SWC. In general, succinylation did not improve the application of whey concentrate in breads. AA

- 3842 WINTBRINGER (GL) and RANHOTRA (GS). Relative bioavailability of magnesium from mineral- and soy-fortified breads. *Cereal Chem*. 60(1); 1983; 14-8

Effects of expanded fortification on the bioavailability of magnesium in bread were examined. Bioavailabilities were calculated using regression equations (based on serum and femur magnesium contents) developed with nonbread diets. Wheat flour provided 55% of the magnesium in test breads. The remaining magnesium (45%) was supplied by magnesium carbonate, alone or in combination with defatted soy flour. No pattern emerged that suggests that magnesium from a single source (wheat, soy, or magnesium carbonate) is more bioavailable. This may be due, in part, to the absence of any striking differences in magnesium absorption from test breads or in fiber excretion patterns of rats. AA

- 3843 EL-SAIED (HM) and EL-FARRA (AHA). Utilization of aqueous by-products from starch for improving bread quality. *Cereal Chem*. 60(2); 1983; 131-4

Aqueous by-products of corn gluten water (CGW), rice gluten water (RGW), and rice steep water (RSW), which resulted during the manufacture of starch by the wet milling of corn and rice, were added in amounts corresponding to 17-50 mg of N/100 g of flour. Addition of these by-products

improved the physical properties of the unyeasted dough, such as resistance to extension, extensibility, water absorption, and mixing requirement, and improved the pasting of a 10% suspension of flour. Moreover, added CGW, RGW, and RSW improved the quality of Balady and European breads and increased their protein content. The amino acid content of Balady bread, after addition of CGW, RGW, and RSW, was analyzed quantitatively. The nutritional value of Balady bread proteins was almost the same, the only deficiencies being in the amino acids threonine, methionine, isoleucine, and lysine. AA

- 3844 AL-ZUBAYDI (AH), AL-KAISSI (AA), SHAKER (KA) and HAMEL (SM). Use of date syrups in breadmaking. *Cereal Chem.* 60(1); 1983; 56-8

The effect of various date syrups on experimental breads was studied with the straight dough procedure. Date syrups were found to cause a substantial increase in the weight and volume of loaves. They also improved the texture of the finished bread. When date syrups were substituted for sucrose in the bread formula, the crumb characteristics became inferior with increasing concentrations of date syrups. These characteristics included colour, aroma, taste, and mastication. Compared to the control treatment, however, which employed no sugar source in the formula, the date-syrup treatment showed improvement in all characteristics except crumb colour, which was adversely affected by all types of date syrups. AA

- 3845 KILBORN (RH), TIPPLES (KH) and PRESTON (KR). Grain research laboratory compression tester; Its description and application to measurement of bread-crumbs properties. *Cereal Chem.* 60(2); 1983; 134-8

BISCUIT

- 3846 CONN (JE) and JELINEK (D). Leavening for bakery production of baking powder biscuits. *Cereal Food World.* 28(3); 1983; 194-6

Use of about 1.8% baking soda, neutralized by a SAPP/SALP leavening acid combination is important in the commercial production of light tender and rich biscuits. Minimum dough mixing and low dough temperatures are important processing factors. AA

PRETZEL

- 3847 MADONNA (MD). Pretzels as low calorie snacks. *Cereal Food World.* 28(5); 1983; 297-9

Pretzels (a type of snackfood), its varieties, calorie, sodium content and nutritional value; production and market are the aspects covered. KAR

COOKIE

- 3848 JELTEMA (MA), ZABIK (ME) and THIEL (LJ). Prediction of cookie quality from dietary fiber components. *Cereal Chem.* 60(3); 1983; 227-30

CRACKER

- 3849 LANE (RP). Formulation variables affecting the flavour of extruded snacks and crackers. *Cereal Food World.* 28(3); 1983; 181-3

These data indicate that the concept of internal application of flavour to extruded snacks is a technically viable concept that can offer improved product acceptability as compared to a strictly surface application of flavour. The data also show that optimized snack foods require a development scheme that uses carefully balanced formulations designed to create a harmonious relationship among all of the ingredients in the formulation. We also think that the use of sensory analysis techniques, such as surface response methodology, will prove to be an effective means of attaining this goal. AA

CAKE

- 3850 CLOKE (JD), GORDON (J) and DAVIS (EA). Enthalpy changes in model cake systems containing emulsifiers. *Cereal Chem.* 60(2); 1983; 143-6

SPAGETTI

- 3851 DEXTER (JE), KILBORN (RH), MORGAN (BC) and MATSUO (RR). Grain research laboratory compression tester: Instrumental measurement of cooked spaghetti stickiness. *Cereal Chem.* 60(2); 1983; 139-42

The Grain Research Laboratory compression tester, designed for assessment of bread crumb texture, was modified to permit measurement of cooked spaghetti surface stickiness. The basic principle of the test procedure is to compress cooked spaghetti strands under a plunger and, upon lifting the plunger, measure the force of adhesion of the spaghetti to the plunger. Sample sizes as small as 6 g of spaghetti can be tested. Samples tested to date show a range in stickiness from about 400N/m² to 900N/m². Standard deviation of the test is about 40N/m². Test results seemed to be in good agreement with subjective assessment of cooked spaghetti stickiness by an untrained taste panel. Preliminary investigations showed that cooking water quality and spaghetti drying procedure have a large influence on stickiness of cooked spaghetti. Spaghetti stickiness was also related to cooking time and elapsed time after cooking. Protein content did not appear to be strongly related to spaghetti stickiness. AA

MILK AND DAIRY PRODUCTS

- 3852 CHARTA RAM and KULLA (JC). Appraisal of investment viability of Dairy Development Co-operative Federation in North-Western India. *Indian J. Agric. Econ.* 38(1); 1983; 62-76

A detailed economic analysis has been made of the operation of 4 milk plants, whose handling capacity ranges from 15000 to 100,000 l/day, in one of the States of North Western India. The various aspects studied include cost structure, gross benefits structure, benefit cost ratios, and rates of return and pay back period. KMD

- 3853 DE VALDEZ (GF), DE GIORI (GS), DE RUIZ HOLGADO (AAP) and OLIVER (G). Protective effect of adonitol on lactic acid bacteria subjected to freeze-drying. *Appl. Environ. Microbiol.* 45(1); 1983; 302-4

- 3854 REINBOLD (GW). Indicator organisms in dairy products. *Food Technol.* 37(6); 1983; 111-3

The inherent disparity among products have been brought out and the different products tested include, fluid milk, raw and pasteurized milk, butter, cheese and other cultured products ice and other products. KAR

- 3855 RAJOR (RB) and PATIL (GR). Low-cost frozen dessert - an overview. *Indian Dairyman.* 35(1); 1983; 39-42

Efforts to develop low-cost frozen desserts by substituting milk based ingredients like butter-fat and skim milk solids with vegetable fat, soya-bean, butter or whey solids, are reviewed. MVG

MILK

- 3856 ABICHANDANI (H), SARMA (SC) and DHINAN (RN). Containerised system for bulk milk transportation - A concept. *Indian Dairyman.* 35(1); 1983; 35-7
An improved system has been designed and its practical utility discussed. MVG

- 3857 HUNTER (AC) and McCORQUODALE (RM). Evaluation of the direct epifluorescent filter technique for assessing the hygienic condition of milking equipment. *J. Dairy Res.* 50(1); 1983; 9-16

- 3858 SYED ANWAR and UNNIKRISHNAN (V). Effect of heat treatments on stability of ascorbic acid in copper contaminated milk of cows and buffaloes. *J. Food Sci. Technol. (India)* 20(1); 1983; 36-7

To test the sensitivity of ascorbic acid to Cu in milk, cow and buffalo milk were added with 0.4 ppm of Cu and heated at (i) 63 C for 30 minutes (ii) 71 C for 95-20 seconds and (iii) just boiled and cooled to room temperature. These were stored for 48 hours at 5 ± 1 C. After storage, ascorbic acid which was 17.1 mg/l in fresh cow milk was completely destroyed whereas in buffalo milk the destruction of ascorbic acid was 25-40% from the initial value of 22.8 mg/l. KAR

- 3859 DEETH (HC) and SMITH (RAD). Lipolysis and other factors affecting the steam frothing capacity of milk. *Aust. J. Dairy Technol.* 38(1); 1983; 14-9

It was confirmed that poor steam frothing of milk was related to lipolysis. In milk in which lipolysis was induced, steam frothing capacity was markedly decreased when free fatty acid levels (FFA) exceeded 2 μ equivalent/mL. When milk with elevated FFA ($> 2 \mu$ equivalent/mL) was mixed with unlipolysed milk, the resulting mixture exhibited depressed foaming at relatively low FFA, e.g. 1.0-1.2 μ equivalent/mL. Thus bulked raw tanker milk exhibited poor foaming when it contained one or more farm milks with elevated FFA. The steam frothing potential of whole milk was found to be enhanced by heating, homogenizing and by the addition of skim-milk powder, but to be unaffected by the presence of added water, by variation in fat content or by the presence of free fat. Aging of pasteurized milk at refrigeration temperature for 24 or 48 hours did not significantly affect the foaming capacity. AA

- 3860 MIRANDA (G) and PELISSIER (JP). Kinetic studies of the *in vivo* digestion of bovine unheated skim-milk proteins in the rat stomach. *J. Dairy Res.* 50(1); 1983; 27-36

- 3861 PHIPPS (LW). Effects of fat concentration on the homogenization of cream. *J. Dairy Res.* 50(1); 1983; 91-6
- 3862 McPHERSON (AV) and KITCHEN (BJ). The bovine milk fat globule membrane - its formation, composition, structure and behaviour in milk and dairy products. *J. Dairy Res.* 50(1); 1983; 107-33
- 3863 SUYAMA (K), YEOW (T) and NAKAI (S). Vitamin A oxidation products responsible for haylike flavour production in nonfat dry milk. *J. Agric. Food Chem.* 31(1); 1983; 22-6
- 3864 UMETSU (H), MATSUOKA (H) and ICHISHIMA (E). Debitting mechanism of bitter peptides from milk casein by wheat carboxypeptidase. *J. Agric. Food Chem.* 31(1); 1983; 50-53
- 3865 SADHU KHAN (BK) and CHATTORAJ (DK). Physico-chemical studies of the hydration of casein in presence and absence of fat, electrolytes and urea. *Indian J. Biochem. Biophys.* 20(2); 1983; 59-65
- Hydration of defatted casein and that of casein mixed with milk fat in the presence of various electrolytes and urea was studied. Role of water in controlling fat-protein interaction in the presence of salts and urea was also studied using the thermodynamic analysis of the binding interaction. At relative vapour pressures of <0.8 , hydration of casein mixed with milk fat is higher than that of defatted casein. No differences were found in water uptake by casein in presence or absence of fat at water activity of <0.8 . The presence of milk fat increased the hydration of dry casein as indicated by the free energy change (ΔG_w) in bringing the water activity from zero to unity being higher for casein with fat. Values for absolute binding of water (Δn_1) per kg casein was always greater than that of electrolyte (Δn_2) in the presence of electrolytes than in their absence. The change in free energy (ΔG) consequent to transfer of completely hydrated casein from the water surroundings to that of salt solution and the standard energy changes (ΔG°) when all available binding states of casein were in the bound state was also calculated for various systems. MVG
- 3866 SADHU KHAN (BK) and CHATTORAJ (DK). Binding of cationic and anionic detergents to casein in presence and absence of milk fat. *Indian J. Biochem. Biophys.* 20(2); 1983; 66-73
- Molar binding studies (T_a) of casein in presence and absence of milk fat were conducted using, analytical grade ionic detergents, cetyltrimethyl ammonium bromide (CTAB), myristylmethyl ammonium bromide (MTAB), dodecyltrimethylammonium bromide (DTAB), cetyl pyridinium chloride (CPCL) and polyvinylpyrrolidone (PVP). The experiments were conducted under various solution conditions and used the equilibrium dialysis technique. There was no regular change in maximum binding ratio (T_a^m) under the various solution condition including the detergent chain length; T_a^m was greater for binding detergent of casein with milk fat than that of defatted milk fat at identical experimental condition. The standard free energy change (ΔG°) followed the same order as that of T_a^m . Changes in standard enthalpy (ΔH°) and entropy (ΔS°) were greater for binding CTAB to casein with milk fat than those of defatted casein. MVG
- 3867 GERVAIS (A) and CERF (O). Comparison of two models for fitting rennet-induced milk coagulation kinetics. *J. Texture Stud.* 14(1); 1983; 47-59

3868 ONO (T), ODAGIRI (S) and TAKAGI (T). Separation of the submicelles from micellar casein by high performance gel chromatography on a TSK-GEL G4000SW column. *J. Dairy Res.* 50(1); 1983; 37-44

3869 ANDREWS (AT). Proteinases in normal bovine milk and their action on caseins. *J. Dairy Res.* 50(1); 1983; 45-55

3870 PRICE (JC) and MANNING (DJ). The flavour of milk. *Perfum. Flavor.* 8(2); 1983; 50-51,56-8

Discusses: weed taints and off flavours; heat-treatment induced flavours; oxidized flavour; off flavour from bacterial activity; lipolyzed flavours; and radiation induced off flavours. BSN

3871 KEOGH (BP). The longevity of the bacteriophages of lactic streptococci. *Aust. J. Dairy Technol.* 38(1); 1983; 32-3

3872 KAHN (SS) and JOSHI (VK). A note on the antibiotics sensitivity of *E. coli* isolated from market milk of Ludhiana city. *J. Food Sci. Technol.* (India) 20(2); 1983; 86-8

Sensitivity to antibiotics of *E. coli* isolated from market milk of Ludhiana city was studied. The results showed that the isolates were most sensitive to kanamycin and least sensitive to oxytetracyclin. Sensitivity to antibiotics like erythromycin, Kanamycin, Oxytetracyclin, streptomycin, ledramycin, cloxacillin, ampicillin, polymyxin-B and chloramphenicol was shown by 39.62, 84.90, 30.16, 73.58, 43.58, 52.83, 40.14, 79.24 and 62.81% of the isolates respectively. Isolates from raw milk were highly sensitive to kanamycin and polymyxin-B, while those from pasteurized milk were sensitive to kanamycin and streptomycin. Isolates from water and hands were highly sensitive to kanamycin, polymyxin-B and chloramphenicol. However, the enteropathogenic strains showed a variable response to these antibiotics. AA

3873 NOREN (K). Some aspects of the determination of organochlorine contaminants in human milk. *Arch. Environ. Contam. Toxicol.* 12(3); 1983; 277-83

The concentrations of organochlorine pesticides and polychlorinated biphenyls (PCBs) in successive milk fractions collected from two mothers during the course of a feeding were constant for each of the mothers when calculated on a milk fat basis. The levels in milk from one mother collected on six nursing occasions during a 24-hour period were also constant when calculated on the basis of milk fat. When milk collected from three mothers at weekly intervals during several months was analyzed, the levels of *p,p'*-DDT, *p,p'*-DDE and PCBs calculated on a milk fat basis fluctuated slightly in each case; a slight decrease in the concentrations of *p,p'*-DDE and PCBs was observed with time. AA

3874 RAWSON (N) and MAHONEY (RR). A modified method for determination of reactive lysine in milk powder using Remazol Brilliant Blue R. *Food Sci. + Technol.* 16(1); 1983; 1-4

3875 BROSIO (E), ALTOBELLI (G), SHIN YUN YU and DI NOLA (A). A pulsed low resolution NMR study of water binding to powdered milk. *J. Food Technol.* 18(2); 1983; 219-26

Pulsed low resolution NMR was used to study the hydration mechanism of powdered milk samples. The non-exponentiality of the spin-echo decay curves of water was exploited to determine the water mobility, as well as the

relative abundance of bound and free water in the different samples. The analysis of the experimental curves was performed by assuming a chemical exchange between bound and free water. AA

- 3876 KHADER (V) and BHAVANA (DB). Studies on keeping quality of Ghari prepared from cow and buffalo milk. *J. Sci. Food Agric.* 34(7); 1983; 761-7

Ghari prepared from cow and buffalo milk stored at room temperature was found to be acceptable for 2 weeks, whereas refrigerated ghari remained acceptable for 4 weeks. Acidity increased and iodine value decreased on storage but no significant difference was observed between the temperature treatments. Saponification value remained constant throughout the study. The increase in peroxide value was directly proportional to storage time and temperature. Cow ghari had a higher unsaturated fatty acids content but it declined as the storage time increased. No adverse changes were observed in the fatty acids in ghari samples stored at two different temperatures for a period of 4 weeks. AA

- 3877 MITAL (BK). Growth and activity of starter cultures in soy milk. *Indian Dairyman.* 35(1); 1983; 43-8

Efforts were made to the use traditional starter cultures used in the manufacture of fermented milk products, to prepare soy-based fermented foods. It was found that soy milk was a satisfactory medium for the growth of lactic cultures. As sucrose is the major fermentable sugar in soy milk, lactic cultures possessing the ability to ferment sucrose and then produce sufficient amounts of acid in soy milk, could be successfully used to manufacture fermented products from soy milk. Lactic fermentation can also be used for raffinose and stachyose contents, which are believed to contribute to the flatulent properties of soyabeans. However, the limiting factor was the lower pH, brought about by rapid utilisation of sucrose, which inhibited further utilisation of higher saccharides. MVG

- 3878 ZADOW (JG), HARDHAM (JF), KOCAC (HR) and MAYES (JJ). The stability of goat's milk to UHT processing. *Aust. J. Dairy Technol.* 38(1); 1983; 20-23

If the initial pH of goat's milk subjected to UHT processing is below about 6.9, rapid and severe sedimentation occurs in the product. This problem may be controlled by either adjustment of the pH of the milk to well above 7.0, or by the addition of 0.2% di-sodium phosphate to the milk before processing. The higher ionic calcium content of goat's milk compared to cow's milk is probably responsible for the greater instability of goat's milk to UHT processing. AA

- 3879 RAMANNA (BR), BHAT (KK), MAHADEVIAIAH (B), DWARAKANATH (CT), DHANARAJ (S), POTTY (VH) and SEN (DP). Investigations on large scale preparation and preservation of milk burfi. *J. Food Sci. Technol. (India)* 20(2); 1983; 67-71

Khoa (concentrated milk) of good quality with proper consistency was prepared by using steam to concentrate milk instead of coal or gas fired hearths and by using stainless steel jacketed open kettle in place of traditional hearths. In large scale (50 kg) operations, preliminary concentration (30-40 Brix) was done in vacuum (620 mm Hg and 0.2-0.3 kg/cm² steam pressure) in forced circulation evaporator with final concentration being done in open kettle. Burfi was prepared by adding sugar to khoa in 1:2 proportion and 0.15% sorbic acid; 25% of sugar was also replaced by liquid glucose. They were packed in (i) MSAT cellophane, (ii) low density polyethylene (LDPE 400 gauge), (iii) high density polyethylene (HDPE 300 gauge), (iv) MSAT + HDPE, (v) Glassine/polyethylene (PE), (vi) Saran/

Cellosaran/PE laminate, (vii) Paper/Al foil (150 gauge), and (viii) polycel inside and polythene pouch outside. Adding sorbic acid and packing in an inner polycel and outer polythene pouch kept the Burfi for 90 days, instead of 6-8 days as in traditional methods. Addition of liquid glucose was not necessary when this packaging material was used. KAR

CURD

- 3880 RAMET (JP), EL-MAYDA (E) and WEBER (F). Influence of salting of reconstituted milk on curdling by rennet. *J. Texture Stud.* 14(1); 1983; 11-9

The addition of sodium chloride to milk is traditionally used in some areas to prevent microbial and enzymatic spoilage. The effects of salting on the rheological properties of curd have been studied. An increase of the salt content from 0% to 5% induced a progressive decrease of the pH from 6.65 to 6.40 and of the luminosity from 78.23 to 75.68. Clotting and hardening times increased by up to 300%. When pH was adjusted with sodium hydroxide to 6.50 after adding salt and before adding rennet, times were increased by more than 600%. AA

BUTTERMILK

- 3881 RAJOR (RB), GUPTA (SK), PATEL (AA) and PATIL (GR). A new 'softy' from buttermilk and soyabean. *Indian Dairyman.* 35(1); 1983; 29-32

A soft serve frozen dessert based on buttermilk and whole soyabean has been developed and the method of preparation standardised. Soaked, blanched and dehulled soyabean (35% solids of which 43% is protein and 25% is fat) is ground along with fresh sweet-cream buttermilk (a solids ratio of 1.3 to 1.0 on fat free basis) to obtain a fine slurry. The softy mix is then prepared by adding melted hydrogenated refined groundnut oil (to adjust total fat at 9%) and refined sugar (@ 15%) to the slurry, pretreated to about 65 C. The mix is hydrogenated in two stages at 3000 and 500 psi and pasteurised by flash heating to 85 C, cooled to 15 C, aged for 2 hours at the same temperature and frozen in the conventional "softy machine" to obtain a ready-to-serve product. The softy contains 15% sugar, 9% fat and 36% total solids. Its protein content (6.0%) compares with that of milk protein. The product has higher melting resistance than traditional ice cream. Due to presence of protein in the mix, there is no need to use any stabiliser. The overall sensory quality (score, 7.0) is comparable to the milkbased product and a higher sensory score (7.2) can be obtained by suitable flavouring like pineapple. The mix can also be spray dried but with only half of the sugar added. The other half is finely ground and added to the powdered mix before packaging. The bacteriological quality of the product is within limit prescribed by the Indian Standards Institution. The cost of producing the product is also worked out. MVG

YOGHURT

- 3882 BROOME (MC), ROGINSKI (H) and HICKEY (MW). The enzymic hydrolysis of lactose in skim milk yogurt. *Aust. J. Dairy Technol.* 38(1); 1983; 35-6
- Stirred skim milk yogurt was manufactured using yeast and fungal lactases for the hydrolysis of lactose in order to impart a sweeter taste to

the yogurt. In taste evaluations, some of the lactase treated yogurts had off-flavours which masked any differences in sweetness between them and the control. The intensity of this extraneous flavour was dependent on the source and concentration of the lactase. With fungal lactase (*Takamine*) significant extraneous flavours were detected when lactase concentrations greater than 250 enzymes unit/I, were used. When yogurts were treated with yeast lactases, two (*Hydrolact S-250*) and (*Lactozym 1500L*) caused detectable extraneous flavours when hydrolysis levels exceeded 60%, but with a third yeast lactase (*Godo*) there were no flavour problems. The concentration of lactase necessary to give specific levels of lactose hydrolysis is also reported. AA

BUTTER

- 3883 PAGE (GG), HANNAH (DJ) and ROSNERT (AA). Packaging of salted butter in metal cans. *Food Technol. NZ.* 18(2); 1983; 42-3

Salted butter is potentially corrosive to metal containers, but adequate protection can be achieved in lacquered cans if proper control of 37 listed factors is assured. KAR

- 3884 SANKARAN (R), MOHAN (MS) and LEELA (RK). Is potassium sorbate necessary for preserving canned butter? *J. Food Sci. Technol. (India)* 20(2); 1983; 80-83

Canned butter was added with 0.1% potassium sorbate and 10% milk powder and the changes in microflora, total viable count, staphylococci, caseolytic and lipolytic counts were studied when stored at 10 C, 27 C and 37 C for 45 and 90 days. Addition of whole milk powder lowered the bacterial population at higher ambient temperatures. Addition of potassium sorbate is not necessary as the microbial load in samples not containing potassium sorbate did not increase. The presence of air prolonged the survival of molds in butter. KAR

WHEY

- 3885 SPROSSLER (B) and PLAINER (H). Immobilized lactase for processing whey. *Food Technol.* 37(10); 1983; 93-5

- 3886 ZADOW (JG), HARDHAM (JF) and MARSHALL (SC). Sulphydryl residues in whey protein concentrates and their effect on bread baking characteristics in a model system. *Aust. J. Dairy Technol.* 38(1); 1983; 27-8

Addition of whey protein concentrate itself resulted in a marked decrease in loaf volume. Chemical blockage of the sulphydryl residues resulted in a marked improvement in baking characteristics. KAR

CHEESE

- 3887 OMAR (MM), ASHOUR (M), FARAHAT (SM), ABDEL BAKY (AA) and El-NESHAWY (AA). Chemical changes during the ripening of Domiati cheese made from dried milk. *Food Chem.* 11(2); 1983; 95-103

- 3888 PEACE (DM). Reproductive success of the mite *Acarus siro* L. on stored cheddar cheese of different ages. *J. Stored Prod. Res.* 19(3); 1983; 97-104

Life history data show that *Acarus siro* L. reared under warehouse conditions of 11-13 C and 85-88% r.h. can develop on cheddar cheese of any age with approximately the same egg production, size, survival, and rate of development. The highest mortality occurred when mites, especially the larvae, became trapped in the oily exudates of cheese. The mites could increase in numbers on cheddar cheese contaminated with the mould *Penicillium verrucosum* and on a sterilized culture of this mould though not as successfully as on uninfected cheddar. AA

- 3889 GERVAIS (A) and VERMEIRE (D). A critical study and improvement of the cheese curd torsionmeter. *J. Texture Stud.* 14(1); 1983; 31-45

ICECREAM

- 3890 RAJALAKSHMI. The microbiological quality of icecreams sold in Hyderabad city. *J. Food Sci. Technol. (India)* 20(1); 1983; 19-20

The bacteriological quality of icecream and ice fruits collected from hotels, restaurants, icecream parlours and local vendors of Hyderabad city (India) were assessed for standard plate count (SPC), coliforms and pathogens. Slabs, cups, chacobars, cones, and lolly's were the different types of icecreams examined separately. *Staphylococcus aureus* was isolated from 20.3% of the samples and *Escherichia coli* from 7% of the samples. Of the 301 samples collected, 58 were within Indian Standards specification for SPC and coliform counts. KAR

MEAT AND POULTRY

- 3891 LEE (K) and GREGER (JL). Bioavailability and chemistry of iron from nitrite-cured meats. *Food Technol.* 37(10); 1983; 139-44

Aspects covered are: factors that enhance iron absorption; role of heme iron in meat, ascorbate and iron absorption, nitrite effects on iron in animal models; human bioavailability of iron from cured meats; and estimation of bioavailability from a cured meat diet. KAR

- 3892 MITTAL (GS), BLAISDELL (JL) and HERUM (FL). Moisture mobility in meat emulsion during thermal processing: Analysis of slab moisture profile. *Meat Sci.* 9(1); 1983; 15-32

A determination of the moisture distribution in meat emulsion slab at several process times as a function of its composition and temperature, and smokehouse relative humidity, with a technique and model for determining the corresponding moisture mobility are presented. The moisture diffusivity was increasing with the decrease in the fat-protein ratio and increase in the product temperature and moisture concentration and follows an Arrhenius type relationship. The moisture profiles in the meat emulsion during processing were very steep at the product surface. AA

- 3893 PICKSTON (L) and DRYSDALE (JM). A survey of minced meat for sulphur dioxide, ascorbic acid and erythorbic acid. *Food Technol. NZ.* 18(1); 1983; 13-4

- 3894 TOMPKIN (RB). Indicator organisms in meat and poultry products. *Food Technol.* 37(6); 1983; 107-10

This article discusses the value of microbial indicators for assessing the microbiological safety, sanitary quality and rate of spoilage of meat and poultry products. More concentration is on the use of microbial indicators for pot fries, cream fries, hash browns, ground beef, and cooked cured meats. KAR

- 3895 DOYLE (MP) and HUGDAHL (MB). Improved procedure for recovery of *Yersinia enterocolitica* from meats. *Appl. Environ. Microbiol.* 45(1); 1983; 127-35

A 1- to 3-day enrichment-KOH postenrichment procedure was evaluated and found to be as effective in recovering *Yersinia enterocolitica* from meats as a 14- to 21-day cold enrichment procedure, with or without KOH postenrichment. The shortened procedure consists of enriching 1.0- and 25-g samples of meat in phosphate-buffered saline (pH 7.2) at 25 C. After incubation (48 and 72 hours for 1.0-g samples and 24 and 48 hours for 25-g samples), 0.5-ml portions of enrichment culture were treated with 4.5 ml of 0.25% KOH-0.5% NaCl for 2 minutes and 0.5% KOH-0.5% NaCl for 15 seconds, and 0.1-ml portions of treated culture were plated onto MacConkey or CIN agars or both. The procedure effectively recovered 2 to 12 cells of a number of both mouse-virulent and a virulent strains per g of ground beef with aerobic plate counts of approximately 10^6 to 10^7 CFU/g. Similarly, the procedure isolated both likely virulent and avirulent strains from porcine tongues (aerobic plate counts of 10^5 to 10^7 CFU/g) naturally contaminated with *Y. enterocolitica*. The organism was isolated from the tongues at similar rates by both shortened enrichment and cold enrichment procedures. Eight tongues were positive for serotype O:5,27 strains that agglutinate with WA-specific absorbed antiserum, an antiserum specific for mouse-virulent *Y. enterocolitica* (Doyle et al., *Infect. Immun.* 37:1234-1240, 1982), indicating that the oral cavity of swine is a reservoir of likely virulent serotype O:5,27 strains. AA

- 3896 KANNER (J) and KINSELLA (JE). Lipid deterioration initiated by phagocytic cells in muscle foods: β -carotene destruction by a myeloperoxidase hydrogen peroxide-halide system. *J. Agric. Food Chem.* 31(2); 1983; 370-76

BEEF

- 3897 ABDALLAH (OY). Tissue growth patterns in the carcasses of water buffalo and Friesian crossbred cattle: Part 2 - Individual bones and anatomical bone groups. *Meat Sci.* 9(1); 1983; 7-14
- 3898 MUNRO (PA). The tensile properties of frozen and thawed lean beef. *Meat Sci.* 9(1); 1983; 43-61
- 3899 GULLETT (EA), JONES (SDM) and HINES (RJ). Palatability of longissimus dorsi roasts of young and mature dairy cows. *Can. Inst. Food Sci. Technol. J.* 16(1); 1983; 19-24

- 3900 WOOD (DF) and FROEHLICH (DA). The effect of electrical stimulation on sensory and physical properties of steaks from three grades of Canadian beef after commercial handling. *Can. Inst. Food Sci. Technol. J.* 16(1); 1983; 52-6
- 3901 VARCOE (G) and JONES (SDM). The measurement of sarcomere length in beef longissimus muscle by laser diffraction and oil immersion microscopy. *Can. Inst. Food Sci. Technol. J.* 16(1); 1983; 82-3
- 3902 BJELDANES (LF), MORRIS (MM), TIMOURIAN (H) and HATCH (FT). Effects of meat composition and cooking conditions on mutagen formation in fried ground beef. *J. Agric. Food Chem.* 31(1); 1983; 18-21
- The influence of meat composition and conditions of cooking on mutagen formation in fried ground beef was examined. Ground beef patties or reconstituted samples prepared from dehydrated and defatted meat were fried for various times (2-20 min/side) at one or a series of temperatures (150-300 C) on stainless steel or other cooking surfaces. The mutagenicity of the exterior portion was determined with *Salmonella* strain TA 1538. Weight loss, water content in the outer portion, and reflectance of the surface of the cooked meat were also determined. The metallic and Teflon surfaces produced similar levels of mutagenicity in samples cooked under similar conditions. The ceramic and enamel surface appeared to retard frying rates with correspondingly reduced levels of mutagenicity. Mutagen production was strongly dependent on water content of the reconstituted patties above 40%. Mutagenicity was nearly independent of fat content with the totally defatted samples producing maximum mutagenicity in this series. AA

SHEEP

- 3903 KAMEL (BS). Characteristics, composition and oxidative stability of sheep tail tallow. *Can. Inst. Food Sci. Technol. J.* 16(1); 1983; 76-8
- 3904 MURTHY (TRK). Aerobic mesophilic count of fresh and refrigerated ground mutton: effect of plating and incubation temperature. *J. Food Sci. Technol. (India)* 20(2); 1983; 83-4
- Pour and spread plate methods were compared at incubation temperature of 30 and 37 C for enumeration of aerobic mesophiles in fresh and refrigerated ground mutton. Spread plating resulted in significantly higher recovery of microbial contamination than pour plating in both fresh and refrigerated meats. Incubation temperature of 30 or 37 C may be used for screening retail market meats and 30 C for refrigerated meats. AA

GOAT

- 3905 GUPTA (LK), KALRA (MS), AJIT SINGH and BALWANT SINGH. Penetration of bacteria into muscles of goat, pork and poultry meat. *J. Food Sci. Technol. (India)* 20(1); 1983; 13-6
- Extent of penetration of bacteria into goat, pork and meat muscle was studied by inoculating *B. cereus*, *Staphylococcus aureus*, *Escherichia coli* and *Salmonella typhimurium* and incubating for 20-40 hours. *B. cereus* and *S. aureus* caused linear proteolysis, while *S. typhimurium* penetrated along the perimyoseal septa in goat muscle. In pork, *B. cereus* and *E. coli* showed linear proteolysis, while *S. aureus* and *S. typhimurium* produced extensive

liquifaction along the peri- and endomyseal septa. In poultry muscle, proteolysis occurred along peri- and endomyseal septa. by *B. cereus*, *S. aureus* and *E. coli*.

PORK

- 3906 SWATLAND (HJ). Measurement of electrical stunning, rate of exsanguination, and reflex activity of pigs in an abattoir. *Can. Inst. Food Sci. Technol. J.* 16(1); 1983; 35-8

Forty-eight pigs in an abattoir were slaughtered by exsanguination after being electrically stunned (565 V 60 Hz, open circuit). The stunning current was monitored from a link between the stunner electrodes and the transformer. The voltage dropped from 258 to 152V during stunning but the amperage increased to 1.1 A (mean values). A load cell in the shackling chain measured the rate of weight loss from the carcass due to exsanguination, and vertical displacement (bouncing) due to reflex activity. Weight loss due to exsanguination of otherwise intact carcasses was approximately 4.1% of live weight. With the large stunning currents used in the study (mean 42,185 W-s), there was rarely any evidence of ventricular contraction during the maximum rate of exsanguination at the start of the operation. Reflex activity demonstrated by electromyography of the unshackled ham, the forelimbs and the head, was correlated with vertical displacement of carcasses monitored from the load cell. AA

- 3907 JAMES (SJ), GIGIEL (AJ) and HUDSON (WR). The ultra rapid chilling of pork. *Meat Sci.* 9(1); 1983; 63-78

Pork carcasses and sides were ultra rapidly chilled in air at -30 C and 1 m/s for 4 hours and compared with controls chilled in air at 0 C and 0.5 m/s for 24 hours. All the required heat was removed during the 4-hour process, there was a 1% saving in evaporative weight loss, the pork could be cut and packed immediately and there were no important differences in appearance and bacteriological quality. The loin from sides, but not carcasses, froze during chilling and showed a fourfold increase in drip loss. Loins from both sides and carcasses were tougher than the controls. AA

- 3908 SCHMIDT (GR), MEANS (WJ), HERRIOT (DF) and MILLER (BF). The functionality of soy protein concentrate in canned luncheon meat. *Food Sci. + Technol.* 16(1); 1983; 55-8

The functional properties of STA-PRO 3200 soy protein concentrate (SPC), in a water and pork backfat emulsion that is subsequently blended into a canned, pork luncheon meat, were studied. Addition of 4% SPC significantly reduced the amount of moisture released during pasteurization and sterilization. Addition of 4% SPC also reduced the amount of fat and moisture cookout in the pasteurized product by 31%, and in the sterilized product by 33%. There was no effect of salt level. The pasteurized product had significantly less cookout than the sterilized product. KMD

- 3909 PADDA (GS) and KONDAIAH (N). Incorporation of texturized soy proteins in fresh pork sausages. *J. Food Sci. Technol. (India)* 20(3); 1983; 129-30

Texturized soy products (TSP) were added to fresh pork sausages at 3, 5, 10 and 15% levels. Addition of TSP improved the protein content and lowered the fat content of sausages. Taste panel studies indicated a high

acceptability of fresh pork sausages at 5 and 10% levels and even at 15% addition, fair to good acceptability was observed. AA

- 3910 HO (C-T), LEE (KN) and JIN (QZ). Isolation and identification of volatile flavour compounds in fried bacon. *J. Agric. Food Chem.* 31(2); 1983; 336-42

Volatile flavour compounds were isolated from 120 lb of fried bacon by a specially designed apparatus. The isolated volatile flavour compounds were subjected to extensive gas chromatographic fractionation, and the pure fractions obtained were identified by infrared and mass spectrometry. A total of 135 compounds were identified. The compounds identified in the volatiles of fried bacon included hydrocarbons, alcohols, ketones, aldehydes, acids, esters, ethers, phenols, pyrazines, furans, thiazoles, oxazoles, oxazolines, pyrroles, pyridines, and miscellaneous compounds. Two interesting halogenated pyrroles, N-acetyl-2-chloropyrrole and N-acetyl-2-bromopyrrole, were synthesized to confirm the identification. AA

POULTRY

- 3911 KHANNA (N) and PANDA (PC). Percent yield of cut-up parts of poultry. *Avian Res.* 67(2); 1983; 48-51

A significant difference among the cut-up parts of male and female poultry was found only in respect of breast and back cuts which was more in females than in males. In the case of ducks, the females yielded significantly larger breast, back, and wing cuts, and significantly smaller neck cuts. Increase in the dressed weight of chickens had no influence on the percent yield of the various cuts studied. The edible meat from chickens, turkeys and ducks was 41.78, 42.17, and 29.9% of their live weight respectively, while the bone contents were 12.63, 12.24, and 9.22% of their live weight respectively. KMD

- 3912 HARIHARAN (P) and SUNDERESAN (K). The use of pesticides in poultry. *Poultry Guide.* 20(12); 1983; 67-70

The authors have given an outline of: (i) the common types of pesticides used in poultry houses; (ii) the mode of action and risks in the use of pesticides; (iii) precautions against toxicity and antidotes. KMD

CHICKEN

- 3913 HANSEN (LG), TUINSTRA (LGM Th), KAN (CA), STRIK (JJTWA) and KOEMAN (JH). Accumulation of chlorobiphenyls in chicken fat and liver after feeding Aroclor 1254 directly or fat from swine fed Aroclor 1254. *J. Agric. Food Chem.* 31(2); 1983; 254-60

- 3914 RAO (VN), JOSHI (HC), ABHAYKUMAR . Therapeutic efficacy of garlic (*Allium sativum*) against *Escherichia coli* infection in chickens. *Avian Res.* 67(1); 1983; 26-27

Garlic chips, incorporated at 4% level into the diet of chicks for 4 days, could successfully control diarrhoea (due to *E.coli*) and check mortality in the flock. The therapeutic effect of garlic was further confirmed by testing the *in vitro* sensitivity of the *E. coli* isolate. The birds showed no side-effects, either during the treatment or 15 days thereafter. KMD

- 3915 VESELA (D), VESELY (D) and JELINEK (R). Toxic effects of ochratoxin A and citrinin, alone and in combination, on chicken embryos. *Appl. Environ. Microbiol.* 45(1); 1983; 91-3

- 3916 ANON. Effect of rancidity on feeding value of rice bran. *Poultry Guide.* 20(12); 1983; 43-4

The growth rate of broilers is adversely affected by the presence of rancid rice bran in the feed. Rice bran in poultry feed can be stabilized either by autoclaving - which is expensive - or by the addition of EDTA or antioxidants like ethoxyquin, BHA, BHT, and propylgallate. A mixture of the last three compounds, at a rate of 260 g per t of rice bran is recommended. KMD

TURKEY

- 3917 PANDA (PC). Shelf-life and microflora of dressed hot packaged turkey cut-up parts. *Avian Res.* 67(1); 1983; 4-8

The shelf life of hot-packaged, turkey, cut-up parts at 2-4 C was three days longer than that of washed and chilled turkey parts. The microflora of different, fresh cut-up parts varied with their anatomical position. *Alcaligenes*, *Staphylococcus*, and *Micrococcus* predominated among the organisms found on hot packaged parts, while *Alcaligenes*, *Achromobacter*, *Staphylococcus*, and *Pseudomonas* spp. were prominent among the isolates obtained from washed and chilled parts. KMD

EGG

- 3918 MAHAPATRA (SK) and DAS (H). A mechanism for breaking egg and separating albumen. *J. Food Sci. Technol.* (India) 20(3); 1983; 111-5

The egg breaker-separator developed has two components, viz. a 'Breaker Unit' and a 'Separator Unit'. The breaker unit breaks the egg and releases its liquid contents with yolk intact and the separator unit separates albumen from yolk. The breaker unit consists of a pair of chain and sprocket drives, juxtaposed on a horizontal plane. The chains are provided with half cups and each half cup with a spring loaded knife. A pair of half-cups facing each other forms a receptacle for a single egg. Egg gets cracked when the half-cups move against an overhead fixed plate. Cracked eggs are opened as the half-cups move apart on the sprockets. The contents of egg are directed to the separator unit which consists of sheet metal channel having a rectangular slot. Albumen gets drained through the slot and the yolk is left behind. The equipment could break and separate about 12 eggs/minute with a separating efficiency of 97%. AA

- 3919 MILLER (LL) and SETSER (C). Xanthan gum in a reduced-egg-white angel food cake. *Cereal Chem.* 60(1); 1983; 62-4

Additions of 0.4% xanthan gum, 50% water, and/or 25% wheat starch, based on flour weight and in all possible combinations, were made to angel food cakes containing 65% total egg white. Analysis of variance of physical and sensory data revealed that the cakes differed significantly ($P \leq 0.05$) as a result of treatment. Xanthan gum increased foam stability, and wheat starch contributed to structure of cakes containing reduced egg white. Added water lowered egg-white surface tension, allowing greater air incorporation. Instrumental measurements of firmness and springiness and sensory

analysis by a six-member, experienced panel (using a five-point category scale) indicated that cakes with 50% added water and 25% wheat starch were more similar to 100% egg-white cakes than were cakes in which xanthan gum was used alone or in combination with water and wheat starch. AA

- 3920 SIBGHATULLAH and SALAHUDDIN (A). A study of salting-out behaviour of egg-white trypsin inhibitor. *Indian J. Biochem. Biophys.* 20(5); 1983; 259-62

The solubility of egg-white trypsin inhibitor, a protein containing as much as 25% carbohydrate was studied in ammonium sulphate solution as a function of ionic strength and pH at 25 C. At a relatively higher salt concentration (above 2.3M), salting-out of the protein from solution (4.75 mg/ml) occurred at pH 7.0. The solubility was significantly increased in 2.46 M salt and pH 7.0 in the presence of glucose, dextran and glycogen. The study revealed an unusual pH-independence of K_s and β , the salting-out parameters determined as a function of pH, in the pH range 7.0-3.6 when ovomucoid undergoes acid denaturation, with the enhancement of the protein solubility in the presence of free carbohydrates. MVG

- 3921 VERRIPS (T) and RENEE VAN RHEE. Effects of egg yolk and salt on micrococccae heat resistance. *Appl. Environ. Microbiol.* 45(1); 1983; 1-5

The heat resistance and growth possibilities of various members of the *Micrococcaceae* in egg yolk and egg yolk with added salt were determined. Egg yolk alone protected members of the *Micrococcaceae* considerably against heat. Whereas in water *Staphylococcus aureus* S6 had a decimal reduction time (D) value of 66 s at 55 C, its D value in egg yolk at the same temperature was 246 s. In salted egg yolk (water activity, 0.95), *S. aureus* S6 had a D value of 180 s at 66 C and was largely inactivated during the pasteurization processes currently applied. *Micrococcus saprophyticus* and *S. epidermidis* (D value of each under the same conditions, 390 s) could survive such treatments to a certain extent and can thus spoil commercial egg yolk. AA

- 3922 SHYAM SUNDER (G) and SIDDIQUI (SM). Effect of oil treatments on the peelability of chicken eggs when held under refrigerated storage. *Avian Res.* 67(1); 1983; 13-6

Oil treated eggs, especially those that were dipped in oil, showed the least rise of albumen pH, and consequently gave poor peeling scores (after being hardboiled) when compared to the untreated eggs. However, the addition of 1% NaCl to the boiling water facilitated easy peeling of oil dipped eggs. KMD

SEAFOODS

- 3923 SUBRAMANIAM (P). Manoeuvre of mangrove (aquaculture for integrated rural development. *Seafood Export J.* 15(8); 1983; 5-16

Mangrove forests and swamps cover about 683,000 ha in India. It has been suggested by FAO/UNDP that aquaculture could be resorted to, in order to develop such areas economically. The author has, therefore, studied the prospects of culturing prawns and crabs in the mangrove forest at Pitchaveram in the Coleroon estuary. Details are given relating to water quality, pond preparation, farm maintenance, as well as financial expenditure and returns. The preparation of a 5-hectare pond with strong bunds

would cost about Rs.105,000/- and the annual nett profit from prawn culture would be Rs.115,000/-. KMD

FISH

- 3924 ANON. Symposium on "Harvest and Post-Harvest Technology of Fish", 24th Nov. 1982, Cochin. *Seafood Export J.* 15(2); 1983; 15-7
- 3925 KRISHNA IYER (H), SRINIVASA RAO (P), UNNITHAN (GR), KESAVAN NAIR (AK) and NAIR (RG). Is there any excess capacity in our fish processing (freezing) plants? *Seafood Export J.* 15(2); 1983; 5-11
- 3926 DORAIRAJ (V). High molecular weight high density polyethylene film (HM/HDPE film) for frozen fish packaging. *Seafood Export J.* 15(1); 1983; 19-20
High molecular weight, high-density polyethylene film (HM/HDPE film) can reduce the packaging cost of a 2 kg block of frozen shrimp by 6 paise. If adopted, it can save Rs. 1.6 million annually for the Indian frozen shrimp industry. KMD
- 3927 QUARANTA (HO) and PEREZ (SS). Chemical methods for measuring changes in freeze stored fish: A review. *Food Chem.* 11(2); 1983; 79-85
A variety of lipid extraction methods, protein and amino acids assay procedures, trimethylamine production and enzymatic activity evaluation are discussed. KAR
- 3928 ANON. 500 tonne frozen storage commissioned. *Seafood Export J.* 15(8); 1983; 19-20
- 3929 MATCHES (JR) and ABEYTA (C). Indicator organisms in fish and shellfish. *Food Technol.* 37(6); 1983; 114-7
- 3930 KRONE (CA) and IWAOKA (WT). Differences in observed mutagenicity associated with the extraction of mutagens from cooked fish. *J. Agric. Food Chem.* 31(2); 1983; 428-31
- 3931 CHAYOVAN (S), RAO (RM), LIUZZO (JA) and KHAN (MA). Fatty acids and sensory acceptance of a dietary sodium-potassium fish sauce. *J. Agric. Food Chem.* 31(1); 1983; 14-7
Two varieties of fish, (1) flounder, a lean fish with low fat (1.6%), and (2) trout, a fatty fish with 9.2% fat, were used in the preparation of fish sauce. The preparation of sauce consisted of fermenting a mixture of uneviscerated ground fish and sodium and potassium salts in different fish-to-salt ratios. Desired ratios of these salts in the sauce were obtained by mixing appropriate volumes of individual salt-based sauces. Identification of fatty acids was accomplished by gas chromatography. Results showed that all samples contained volatile fatty acids from C-2 to C-6 and nonvolatile fatty acids from C-8 to C-18 in various proportions. In all the samples, isovaleric acid was in the highest concentration followed by acetic and isobutyric acids. Sensory analyses indicated that a sodium-potassium dietary fish sauce could prove to be a possible replacement for an all sodium chloride sauce provided the salt ratios do not exceed 40:60. AA

SHARK

- 3932 SANTHANAKRISHNAN (G). A diversified product and its export potential from India. *Seafood Export J.* 15(2); 1983; 19-24

Elasmobranchs - of which sharks constitute the major fraction - account for a sizeable percentage of the Indian marine fish catch. Sharks are caught almost throughout the year in the various coastal states of India. Hence, the author has undertaken this study on the development of export markets for frozen HGG sharks or "carcasses" as they are called in Europe - i.e. de-gutted sharks without head, tail, or fins, but with the skin on. The processing of this kind of product has been described briefly. KMD

SARDINE

- 3933 ANON. Meet your fish - the sardine. *Seafood Export J.* 15(11); 1983; 32-3
Some salient facts regarding the oil sardine (*Sardinella longiceps*) have been presented in this brief note. KMD

WHITEFISH

- 3934 JOSEPHSON (DB), LINDSAY (RC) and STUIBER (DA). Identification of compounds characterizing the aroma of fresh whitefish (*Coregonus clupeaformis*). *J. Agric. Food Chem.* 31(2); 1983; 326-30

Volatile compounds collected on Tenax GC at room temperature (21 C) from direct headspace purging of fresh uncooked whitefish (*Coregonus clupeaformis*) were separated by gas chromatography and identified by mass spectrometry, odour quality, and retention indices (I_E). Two distinct families of compounds previously associated with cucumber and melon fruits and mushrooms were identified as principal contributors to fresh whitefish aroma. Compounds responsible for a strong cucumber-like top note aroma were identified as (E)-2-nonenal, (E,Z)-2,6-nonadienal, and 6-nonen-1-ol, 1-Octen-3-ol, 1-octen-3-one, 1,5-octadien-3-ol, 1,5-octadien-3-one, and 2,5-octadien-1-ol were principle contributors to a heavy, plant-like aroma. Twelve compounds were found above reported threshold concentrations and thus appear to contribute to the overall characterizing aroma of fresh whitefish. AA

COD

- 3935 DURU (LAD). Isolation and characterization of branched chain fatty acids (other than those derived from phytol) in cod liver oil. *J. Food Technol.* 18(2); 1983; 207-17

HAKE

- 3936 QUARANTA (HO) and CURZIO (OA). Total volatile acids content as a quality index of irradiated hake (*Merluccius merluccius hubbsii*) fillets. *Food Chem.* 11(1); 1983; 27-30
Irradiation of hake (*Merluccius merluccius hubbsii*) fillets with

500 krad (5 kGy) of Co⁶⁰ gamma rays caused a delay in the formation of volatile acids during storage under refrigeration at 4-5 C. Loss in organoleptic acceptability could be correlated with the increase in volatile acids both in the unirradiated and irradiated fish stored at 4-5 C, suggesting that the volatile acids number (VAN) can be a useful tool for the quality evaluation of hake fillets. AA

MACKEREL

- 3937 KRISHNOJI RAO (BY) and BANDYOPADHYAYA (C). Lipid composition of salted sun-dried Indian mackerel (*Rastrelliger kanagurta*). *J. Food Sci. Technol.* (India) 20(2); 1983; 62-4

Lipid composition of 2 commercial samples of salted sun-dried Indian mackerel was determined. A considerable reduction in glyceride content and iodine value with a concomitant increase in free fatty acid content and peroxide value of muscle lipid was observed in sun-dried salted mackerel compared to fresh mackerel. Salting and sun-drying also caused considerable loss of higher poly unsaturated fatty acids due to oxidation as determined by GLC. KAR

PRAWN

- 3938 GOVINDAN (TK). Packagings for frozen prawn products. Part III. Polythene film and box-strappings. *Seafood Export J.* 15(1); 1983; 5-8

A number of samples of low density polythene film (LDPE) and high molecular weight high density polythene films (HM-HDPE) were collected from frozen prawn industry and were analysed for tearing strength, tensile strength, water vapour transmission rate, and xylene and hexane extractives. Substitution of the conventional 100/125 gauge LDPE film with 40-gauge HM-HDPE film results in substantial savings in the packaging costs, without affecting the efficiency of the packaging. Recycled HDPE straps give satisfactory results when used for reinforcement of corrugated, fibre-board master cartons. (For part II see *Seafood Export J.* 14(9); 1982; 18-21)

SHRIMP

- 3939 SANTHANAKRISHNAN (G). Hitherto unstudied region-wise species wise-size wise export pattern of shrimps from India into Japan. *Seafood Export J.* 15(8); 1983; 23-5

- 3940 SANTHANAKRISHNAN (G) Raw head on shrimps. *Seafood Export J.* 15(1); 1983; 9-14

Handling and processing conditions for the production of raw-head on shrimps including the species, suitable, handling on board, processing, freezing, packing and storage have been discussed. Guidance is provided on the transportation of this product, and its marketing in European countries. KMD

- 3941 VEENA (KM) and LEKSHMY AMMAL (N). Effect of differential concentrations of mercury on the shrimp *Penaeus monodon* and the subsequent bioaccumulation. *Seafood Export J.* 15(6); 1983; 15-8

The meat of tiger prawns, *Penaeus monodon*, which were allowed live in

differential concentration of HgCl_2 contained 115-635 ppb of Hg. The minimum lethal Hg concentration was found to be 4 ppm. The survival rate of the organism, and the rate of bioaccumulation of Hg, were proportional to the Hg concentration in the substrate. In differential concentration of Hg ranging from 0.5 to 3.0 ppm, prawns could survive for many days, leading to bioaccumulation of Hg. KMD

MUSSEL

- 3942 HOLLAND (CR), OTTERBURN (MS) and McCOMISKEY (P). Froth flotation as a means of protein extraction from mussels. *J. Food Technol.* 18(2); 1983; 195-205

OYSTER

- 3943 ONOUE (Y), NOGUCHI (T), MARUYAMA (J), HASHIMOTO (K) and SETO (H). Properties of two toxins newly isolated from oysters. *J. Agric. Food Chem.* 31(2); 1983; 420-23

PROTEIN FOODS

- 3944 CHANDRASEKHARA (HN) and RAMANATHAN (G). Gelatinization of weaning food ingredients by different processing conditions. *J. Food Sci. Technol. (India)* 20(3); 1983; 126-8

Weaning food ingredients (flours of wheat, green gram, Bengal gram and groundnut) were precooked, roller dried and viscosity of the reconstituted materials were measured independently as the index of degree of gelatinization. Roasted ingredients gelatinized to a lesser extent compared to unroasted materials. There was considerable gelatinization, when the composite blend was directly roller dried. However precooking (steaming/autoclaving/direct cooking/steam sparging) prior to roller drying considerably reduced the degree of gelatinization. KAR

FRUIT JUICES AND BEVERAGES

- 3945 CHANG (SS) and COOK (JM). Stability studies of stevioside and rebaudioside A in carbonated beverages. *J. Agric. Food Chem.* 31(2); 1983; 409-12

Stability of pure stevioside and rebaudioside A in carbonated phosphoric and citric acidified beverages during long-term storage was observed chemically, microbiologically, and organoleptically. Thin-layer chromatography and high-pressure liquid chromatography were used to follow the chemical degradation of these *Stevia* sweeteners. Some degradation of both sweeteners was observed after 2 months of storage at 37 C; however, there were no significant changes at room temperature or below following 5 months of storage stevioside, or 3 months of storage of rebaudioside A. Exposure to 1 week of sunlight did not affect stevioside but resulted in approximately 20% loss of rebaudioside A. Heating at 60 C for 6 days resulted in 0-6% loss of the sweeteners. AA

- 3946 McBRIDE (RL) and RICHARDSON (KC). Sensory assessment of the shelf life of carbonated soft drinks. *J. Food Technol.* 18(2); 1983; 227-32
- Six commercial soft drinks, in glass bottles and aluminium cans, were stored at 0.6 C and ambient temperature and assessed by a consumer-type sensory panel every 3 months for 2 years. While there was evidence of deterioration with storage, more so at ambient temperature than at 0.6 C, all drinks were still considered satisfactory at the conclusion of the trial. AA
- 3947 BLACKBURN (P). Multi-packs aid retail handling of canned drinks. Research indicates useful time-savings. *Int. Bottler Packer.* 57(4); 1983; 106-8

FRUIT JUICES

- 3948 ADHIKARY (SK), HARKARE((WP), GOVINDAN (KP) and NANJUNDASWAMY (AM). Deacidification of fruit juices by electrodialysis. *Indian J. Technol.* 21(3); 1983; 120-23
- Deacidification of orange, pineapple, and grape juices to an acceptable acidity level of 0.5-0.6% (wt/vol.) by conventional electrodialysis (ED) using .interpolymer cation and anion - exchange membranes and by diffusion through anion-exchange membranes with or without alkali in a transference cell was studied. Deacidification by ED was found technically and economically feasible. Compared with the alkali diffusion process, the optimum energy requirement for ED at 25 V is 0.064 k hour for removal of 1 g equivalent of acid, i.e. about 5% of the alkali diffusion process. The rate of deacidification by ED at 25 V is higher though the linear velocity of flow of juice is lower than in alkali diffusion process. Operating conditions for the ED processes have been worked out. MVG
- 3949 OFFENBACHER (EG) and PI-SUNYER (FX). Temperature and pH effects on the release of chromium from stainless steel into water and fruit juices. *J. Agric. Food Chem.* 31(1); 1983; 89-92
- The effects of pH and temperature on the release of Cr into water and juices exposed to stainless steel were measured in order to investigate whether such incidental Cr in acid foods may have nutritional significance. By use of graphite furnace atomic absorption spectrometry, Cr was determined in acidified water (HCl) and in processed and hand-squeezed fruit juices, before and after heat treatment in stainless steelware. No Cr was released into unacidified water. After 1 hour at 90-95 C, Cr was 54 ppb in pH 2.5 water and 16 ppb in pH 3.0 water; amounts of Cr released into juices were 31-50 ppb (3-5 $\mu\text{g}/100\text{ mL}$). Juice Cr concentration did not vary with pH, probably due to differing acid components. The released Cr passed through a 0.2 μm filter. Since the recommended range for daily Cr intake is 50-200 μg , stainless steelware may contribute to human Cr nutrition if incidental inorganic Cr is absorbed and converted to its biologically active form. AA
- 3950 BEUCHAT (LR). Combined effects of food preservatives and organic acids on thermal inactivation of yeasts in fruit juices. *Food Sci. + Technol.* 16(1); 1983; 51-4
- Experiments were designed to determine the effects of food preservatives (potassium sorbate and sodium benzoate) and elevated levels of organic acids on rates of thermal inactivation of five genera of yeasts in five fruit juices. Apple, apricot, orange and pineapple juices were supplemented

with citric and malic acids, whereas grape juice was supplemented with malic and tartaric acids. Yeasts were generally more sensitive to heat when suspended in orange and pineapple juices compared with the other test juices. Overall, increased concentrations of acids did not have a marked effect on rates of thermal inactivation. However, yeasts were more rapidly inactivated in juices containing sodium benzoate than in juices containing comparable concentrations of potassium sorbate. The lethality of benzoate and sorbate did not appear to be consistently influenced by elevated levels of organic acids. AA

CITRUS

- 3951 COOK (R). Quality of citrus juices as related to composition and processing practices. *Food Technol.* 37(6); 1983; 68-71, 133

The aspects considered include fruit structure, sugars, organic acids, pectin, pulp, enzymes bitter principles, colour, volatile flavours and nutritional components as related quality. Other aspects considered include fruit varieties, fruit maturity, fruit condition and handling, juice extraction and finishing, evaporation, blending, microbial activity and defects of various types. KAR

- 3952 HASEGAWA (S) and MAIER (VP). Solutions to the limonin bitterness problem of citrus juices. *Food Technol.* 37(6); 1983; 73-7

In this article, the biochemistry of limonoid metabolism as related to citrus juice quality is reviewed. Special emphasis is placed on bacterial enzymes involved in limonoid metabolic pathways and the possible use of isolated enzymes or immobilized bacterial cells for limonin debittering of citrus juices. KAR

- 3953 HASEGAWA (S) and PELTON (VA). Reduction of nomilin bitterness in citrus juices and juice serum with *Arthrobacter globiformis* cells immobilized in acrylamide gel. *J. Agric. Food Chem.* 31(1); 1983; 178-80

Nomilin debittering of citrus juices and juice serum was successfully demonstrated with *Arthrobacter globiformis* cells immobilized in acrylamide gel. When juice serum was passed through a column packed with immobilized cells, nomilin was converted to nonbitter 17-dehydronomilinoate A-ring lactone by two enzymes, limonin D-ring lactone hydrolase and limonoate dehydrogenase. The enzyme system in the immobilized cells was as effective toward nomilin as it was toward limonin. AA

GRAPEFRUIT

- 3954 MANSELL (RL), McINTOSH (CA) and VEST (SE). An analysis of the limonin and naringin content of grapefruit juice samples collected from Florida State Test Houses. *J. Agric. Food Chem.* 31(1); 1983; 156-62

An analysis of the limonin and naringin content of 6685 grapefruit juice samples (representing approximately 6% of all grapefruit harvested) collected from three Florida State Test Houses showed that there were statistically significant differences between the Test Houses. There also was a statistically significant difference in the concentration of these compounds in the juice from the different cultivars of fruit sampled. Average limonin and naringin concentrations in the juice remained fairly constant through the beginning of the season until a freeze occurred

in early 1981. Juice obtained from fruit harvested after this freeze contained decreasing amounts of limonin and increasing amounts of naringin through the remainder of the season. Results showed that there was no strong correlative relationship between limonin, naringin, Brix, percent acid, and Brix/acid ratio. AA

ORANGE

- 3955 SHAW (PE), BUSLIG (BS) and WILSON (CW) III. Total citrate content of orange and grapefruit juices. *J. Agric. Food Chem.* 31(1); 1983; 182-4

Total citrate in orange and grapefruit juices was determined by high-performance liquid chromatography and by isotachopheresis. Both methods are rapid and simple and afford results that are in close agreement. Estimation of total citrate by an earlier method afforded slightly higher results, probably because other acids known to be present in some citrus juices, eg. malic and succinic, contributed to that value. AA

- 3956 FISHER (JF). High-performance liquid chromatographic determination of sodium benzoate when used as a tracer to detect pulp wash adulteration of orange juice. *J. Agric. Food Chem.* 31(1); 1983; 66-8

Sodium benzoate was added as a tracer to orange pulp wash. Orange juice diluted with the marked pulp wash was examined by high-performance liquid chromatography for evidence of sodium benzoate. The sample preparation was accomplished with a Sep-PAK C-18 cartridge. Resolution of the sodium benzoate was carried out with a radial compression separation system and an 8-mm C-18 cartridge. Detection was at 230 nm. AA

COFFEE

- 3957 CLO (G) and VOILLEY (A). Evaluation of ground coffee particles for optimum extraction. *Food Sci. + Technol.* 16(1); 1983; 39-42

In the extraction process of the soluble elements from infused coffee ground, the form and dimensions of particles play an important part. Using various analytical techniques, the volume or surface of the particles was measured after separating them into different sizes. For volume measurements, the techniques used (Coulter-counter, porosimeter) give similar results. For surface measurements (image analyser, porosimeter, adsorption of gas), on the contrary, results may be largely different (by a factor of 3). This is explained the large surface developed by the microporosity and by the differences in the measuring thresholds of the techniques. The results obtained by using these values in the model representing the extraction process are compared. AA

- 3958 RAJASEKHAR (T), UDAYASHANKAR (K), ABRAHAM (KO), SESHADRI (R), SHANKARANARAYANA (ML) and RAMANATHAN (PK). Studies on the utilization of coffee by-products. *Indian Coffee* 47(4); 1983; 9-11

Trials were carried out for the recovery of caffeine from the pulp and husk of coffee berries, and also for the beneficiation of the husk by physical methods. The percent caffeine content of various by-products, on moisture-free basis, was: arabica pulp 0.37-0.60, robusta pulp 0.20-0.21; arabica parchment skin 0.14, robusta parchment skin 0.10; arabica cherry husk 0.12-0.52, robusta cherry husk 0.15-0.44; special leaf 0.32, middle leaf 0.33; twigs 0.35, wood 0.12. The husk was powdered in a multi-mill, and particles

of different sizes separated by sieving. The bulk density of these sieve fractions ranged from 0.48-0.6 g/ml and the caffeine content from 0.13-0.24%. KMD

- 3959 UDAYA SANKAR (K), RAGHAVAN (CV), SRINIVASA RAO (PN), LAKSHMINARAYANA RAO (K), KUPPUSWAMY (S) and RAMANATHAN (PK). Studies on the extraction of caffeine from coffee beans. *J. Food Sci. Technol.* (India) 20(2); 1983; 64-67

Studies were carried out on the extraction of caffeine from coffee beans using dichloromethane on a pilot soxhlet extraction unit of capacity 10 kg/batch. Coffee beans were conditioned to moisture content of 40% and extracted till 97% of the initial caffeine was removed. Apparent coefficient of diffusion was calculated using Fick's Law of Diffusion. AA

TEA

- 3960 GUJRAL (S) and NAINA RAJGOR. Protein quality of *Chaisathi* (tea whitener). *J. Food Sci. Technol.* (India) 20(1); 1983; 8-9

The protein quality of *Chaisathi* (protein content 35% and fat 18%) a low cost vegetable protein based milk was evaluated by rat growth studies. The growth rate, protein efficiency ratio, biological value, and net protein utilization indicated that *Chaisathi* protein was comparable to low fat milk, skim milk and casein and is a good substitute for dairy milk. KAR

- 3961 CLOUGHLEY (JB). Factors influencing the caffeine content of black tea: Part 2. The effect of production variables. *Food Chem.* 10(1); 1983; 25-34

Caffeine content changed throughout the various stages of black tea production. The large increase during the withering stage was time dependent, but independent of rate and degree of desiccation. The decrease in caffeine levels during fermentation was related to the time and temperature of fermentation. Minor amounts of caffeine were lost by sublimation during the drying process. Tea stored for 6 months contained more caffeine than the freshly manufactured product. The importance of these changes in caffeine levels with respect to the quality and character of the beverage is discussed. AA

ALCOHOLIC BEVERAGE

- 3962 BECK (O), BOSIN (TR) and LUNDMAN (A). Analysis of 6-hydroxy-1-methyl-1,2,3,4-tetrahydro- β -carboline in alcoholic beverages and food. *J. Agric. Food Chem.* 31(2); 1983; 288-92

6-Hydroxy-1-methyl-1,2,3,4-tetrahydro- β -carboline was identified and quantified in various dietary components. The analytical procedure involved the use of deuterated analogue as the internal standard, extraction with dichloromethane, derivatization with pentafluoropropionic anhydride, and subsequent analysis with glass capillary gas chromatography-mass spectrometry. The compound was found in beer (18-427 nmol/L), wine (0-1.1 nmol/L), fruits (0-1.8 nmol/g), tomatoes (7 pmol/g), and processed cheese (4.5-140 pmol/g). AA

- 3963 BOSIN (TR), LUNDMAN (A) and BECK (O). Identification and quantitation of 6-hydroxy-1,2,3,4-tetrahydro- β -carboline in alcoholic beverages. *J. Agric. Food Chem.* 31(2); 1983; 444-6

- 3964 MORAWSKI (J), DINCER (AK) and IVIE (K). Uses of HPLC in alcoholic beverage and ethanol processing. *Food Technol.* 37(6); 1983; 57-60

Incorporation of HPLC as an analytical instrument to monitor the fermentation process provides rapid, reliable knowledge of the process hitherto unknown for most fermentations. This knowledge supplies the producer with the ability to control the fermentation much more closely, resulting in a more efficient, higher-yield process. The versatility of HPLC is not limited to the saccharide and alcohol analysis of fermentation mashes. Colouring agents, such as tannins and anthocyanins, flavour constituents, such as organic acids and phenolic compounds, and sugar degradation products, such as hydroxymethylfurfural, as well as other components, can, all be analyzed through the application of HPLC. AA

BEER

- 3965 SEBREE (BR), CHUNG (DS) and SEIB (PA). Brewers' condensed solubles. II. Viscosity and viscosity reduction of brewers' condensed solubles by cellulase and beta-glucanase. *Cereal Chem.* 60(2); 1983; 151-4

- 3966 SALISBURY (M). Cleaning of storage vessels in CO₂ atmospheres. *Brewer's Dig.* 58(6); 1983; 40-43

- 3967 ANDERSON (RA) and BRYDEN (NA). Concentration, insulin potentiation, and absorption of chromium in beer. *J. Agric. Food Chem.* 31(2); 1983; 308-11

The chromium content of 27 domestic and imported brands of beer was determined to evaluate the importance of beer as a dietary source of chromium. Chromium concentration of selected beers ranged from 0.48 to 56 ng/mL; concentration of 8 brands of beer was below 2 ng/mL, 11 ranged from 2 to 10, and 8 brands of beer contained more than 10 ng of Cr/mL. Chromium content of the ingredients was not sufficient to account for the high levels of Cr found in some beers; therefore, a significant amount of Cr in beer was due to unidentified sources. Chromium in beer, brewing water, and corn grits displayed insignificant *in vitro* insulin potentiating activity, malt displayed low levels of insulin activity, and hops, which was the highest in total Cr, inhibited *in vitro* insulin activity. Chromium in beer was absorbed by humans similar to the Cr found endogenously in foods. These data demonstrate that the Cr concentration of beer varied widely and that some beer contained significant quantities of chromium that was absorbed by humans. AA

WINE

- 3968 SHARF (R) and MARGALITH (P). The effect of temperature on spontaneous wine fermentation. *European J. Appl. Microbiol. Biotechnol.* 17(5); 1983; 311-3

The fermentation of mixed cultures of apiculate and *Saccharomyces* yeasts at various temperatures was studied employing a selective medium for wine yeasts. In mixed cultures, fermentation at low temperatures (10 C) did not permit suitable propagation of *Saccharomyces* yeast, contrary to pure culture fermentations. It is suspected that under these conditions

the apiculate yeasts produce inhibitory substances that prevent normal reproduction of wine yeasts. AA

- 3969 COSTELLO (PJ), MORRISON (GJ), LEE (TH) and FLEET (GH). Numbers and species of lactic acid bacteria in wines during vinification. *Food Technol. Aust.* 35(1); 1983; 14-8

The numbers and species of lactic acid bacteria were determined at several stages of the production of four Shiraz wines of the 1979 and 1980 vintages at two wineries in the Hunter Valley of New South Wales. Each of the wines supported the sequential development of between two and five species of lactic acid bacteria, with either *Leuconostoc oenos*, *Pediococcus* spp. or these species together responsible for malolactic fermentation. Portions of one 1980 Shiraz wine at the completion of primary fermentation were adjusted to pH 3.29 and 3.69, respectively. The numbers and species of lactic acid bacteria and malic acid levels of these wines together with those of the unadjusted wine (pH 3.40) were determined during storage in sterile containers in the laboratory. As the pH of the wine rose the time of onset of malolactic fermentation shortened and the number of species of lactic acid bacteria which grew in the wine increased. *Leuconostoc oenos* was the sole species isolated from wines of pH 3.29, whereas species *Leuconostoc*, *Pediococcus* and *Lactobacillus* were isolated from wines of pH 3.69. AA

- 3970 SIMPSON (RF), BENNETT (SB) and MILLER (GC). Oxidative pinking of white wines: A note on the influence of sulphur dioxide and ascorbic acid. *Food Technol. Aust.* 35(1); 1983; 34-6

Additions of ascorbic acid and sulphur dioxide were made to five newly made white wines and the effects on the potential for oxidative pinking examined. The higher levels of either ascorbic acid or sulphur dioxide, and intermediate levels of both in combination protected the wines against oxidative pinking. Consideration was also given to the effects of these compounds on the colour stability of wine held in winecasks into which oxygen slowly diffuses. AA

- 3971 REEVES (GW). Wine filtration in the bottling cellar. *Food Technol. Aust.* 35(1); 1983; 28-33

The use of filter sheets and membrane filters for the polishing and sterilising filtration of wines before bottling is discussed. Factors affecting filter performance and economy, and procedures for optimising both aspects, are detailed. A two-stage filtration through diatomaceous earth filters and sheet filters is proposed for microbiologically stable wines; while an additional filtration through membrane filters is recommended for wines susceptible to microbial spoilage. Sterilisation methods, integrity testing of membrane filters, sterility testing and filterability problems are discussed. A method for evaluating wine filterability is outlined. AA

- 3972 SOMERS (TC). Influence of conservation time on the physico-chemical and organoleptic characteristics of wines. *Food Technol. Aust.* 35(1); 1983; 38-43

It is generally observed that the fortified wines require a much longer conservation time to attain their characteristic organoleptic properties which are normally acquired under prolonged oxidative conditions at rather elevated cellar temperatures. In contrast, the white wines and the rose's can be adversely affected by oxidative influences during minimal periods of conservation. The red wines have intermediate requirements in both aspects.

but have by far the greatest longevities in bottle. Changes in the organoleptic characteristics of white wines are associated both with hydrolysis and esterification reactions proceeding towards chemical equilibrium, with significant contributions to bottle age, aroma arising from formation of certain bitter components. For red wines, the phenolic constituents are of major importance, and the concept of 'chemical age' has been advanced to describe the increasing dominance by polymeric pigment forms during wine ageing. KAR

- 3973 SUBDEN (R), HAFFIE (T) and RANCOURT (D). The mutagen content of homemade Canadian wines. *Can. Inst. Food Sci. Technol. J.* 16(1); 1983; 45-51

BRANDY

- 3974 VENKATARAMU (K), PATEL (JD) and SUBBA RAO (MS). Fractionation of wood phenolics and their use in brandy. *J. Food Sci. Technol. (India)* 20(1); 1983; 16-8

Phenolics were extracted from Indian oak (*Quercus* sp.), teak (*Tectona grandis*), red cedar (*Cedrella toona*) and sandal (*Santalum album*) by ethanol. Parameters like ratio of wood to ethanol, concentration of solvent, and time of contact for extraction of phenolics were studied. Extracted phenolics were segregated into, flavonoids and non-flavonoids as well as soluble and insoluble fractions in solvents like chloroform, ethylacetate and amyl alcohol. The fractionated phenolics were estimated after removal of the solvents. Studies on organoleptic evaluation of young brandy on addition of these fractions of phenolics (free from solvents) have indicated that some combination of fractions reduce the harshness of the product. KAR

LIQUOR

- 3975 KUMAR (KR), ANANDASWAMY (B), SUBBA RAO (MS), PATEL (JD), ANANTHA KRISHNA (SM), and GOVINDARAJAN (VS). Evaluation of high density polythene containers for packing distilled liquor. *Perfectorpac.* 23(2); 1983; 20-23

The effects of storing rum in 5-l and 0.5-l high density polythene containers were studied under normal (temp. 27 ± 1 C and RH 65 ± 2) and accelerated temperature conditions (38 ± 1 C, RH 90 ± 2), using rum packed in glass bottles as the control. The changes in total weight of the package, ethanol content, and ester content were measured at periodic intervals; sensory evaluation was also done at the same time. No appreciable changes could be measured over a storage period of 195 days. Flavour of rum decreased noticeably after 90 days of storage under accelerated conditions. KMD

OILS AND FATS

- 3976 LAWRENCE (BM). Progress in essential oils. *Perfum. Flavor.* 8(1); 1983; 61-6
- 3977 LAWRENCE (BM). Progress in essential oils. *Perfum. Flavor.* 8(2); 1983; 61-7

- 3978 HUDSON (BJF) and LEWIS (JI). Polyhydroxy flavonoid antioxidants for edible oils. Structural criteria for activity. *Food Chem.* 10(1); 1983; 47-55

The antioxidant properties of a series of polyhydroxy flavonoids and related compounds have been evaluated. The results have been correlated with the structures of the compounds concerned, which have been shown to function mainly as primary antioxidants. The ability of some such compounds to form complexes with copper has been demonstrated from a study of UV spectra and is probably a contributing factor to the stabilising effects of such compounds. Antioxidant activity is favoured by a multiplicity of phenolic hydroxyl groups and depends critically on the co-operation of the 4-carbonyl with either the 3- or the 5-hydroxyl groups. Dihydro-flavones are slightly more active than the corresponding flavones. AA

- 3979 FARIA (JAF) and MUKAI (MK). Use of a gas chromatographic reactor to study lipid photo-oxidation. *J. Am. Oil Chem. Soc.* 60(1); 1983; 77-81

A gas-chromatographic reactor can be used to study the pro-oxidant activities of different light sources on polyunsaturated lipids, including linoleic acid and safflower oil. The method is presently being developed to predict the stability of fatty foods packaged in transparent or translucent materials. KMD

- 3980 ANON. The hardening plant. *J. Am. Oil Chem. Soc.* 60(3); 1983; 500-511

Transcript of a question and answer session on the operation of an edible oil hardening (i.e. hydrogenation) plant. The questions are grouped under the following headings: (i) hydrogen; (ii) catalyst; (iii) feedstock preparation; (iv) hydrogenation practices; and (v) filtration and bleaching. KMD

CANOLA OIL

- 3981 de MAN (JM), POGORZELSKA (E) and de MAN (L). Effect of the presence of sulphur during the hydrogenation of canola oil. *J. Am. Oil Chem. Soc.* 60(3); 1983; 558-62

Sulphur added to canola oil, in the form of allyl isothiocyanate, at the level of 3 mg/kg under selective conditions (200 C and 7 psi) stopped the hydrogenation at an iodine value of 81; when added 5 mg/kg level, hydrogenation was stopped at IV 88. Under non-selective conditions (160 C and psi), the reaction could be made to reach an iodine value of only 70, even at a S-level of 10 mg/kg. The amount of S bound to a commercial nickel catalyst was always less than the amount bound to Raney nickel. Relatively more S was bound at lower temperatures (longer time) and higher pressures. The formation of trans-isomers was considerably higher when the amount of S added was 3 mg/kg or more. KMD

GROUNDNUT OIL

- 3982 SWARNALATA SRIVASTAVA, SIDDIQUI (MKJ) and SETH (TD). Organochlorine pesticide residues in groundnut oil. *J. Food Sci. Technol.* (India) 20(1); 1983; 25-7

Groundnut oil samples (60) collected from Lucknow and Sitapur (India) were analysed by GLC for residues of DDT and its metabolites (DDD, DDE) aldrin and isomers of HCH. The levels of residues (ppm) detected in Lucknow and Sitapur were BHC (HCH), 1.306, 1.340; Aldrin 0.892 and, 0.290 and DDT and its metabolites (total) 2.960 and 1.956 respectively. MVG

OLIVE OIL

- 3983 SEVERGE (A). Difficulties in physical refining of olive oil, due to presence of triterpene oleanolic acid. *J. Am. Oil Chem. Soc.* 60(3); 1983; 584-7

Oleanolic acid was found to be responsible for the turbidity frequently observed in physically refined olive oil. General procedures for eliminating this problem and improving the final quality have been discussed. Special attention was given to optimizing the operating parameters of the deodorizer and keeping the rest of the physical refining process constant. AA

- 3984 DAMIANI (P), BURINI (G) and DADDI (P). Chemometrics in food research. Relationships between triglyceride groups and fatty acid composition in olive oil. *J. Am. Oil Chem. Soc.* 60(3); 1983; 539-43

RAPESEED OIL

- 3985 KRISHNA MURTHY (MN), RAJALAKSHMI (S), MALLIKA (T), VIBHAKAR (S), ANKAIAH (KN), NASIRULLAH, NAGARAJA (KV) and KAPUR (OP). Physico-chemical characteristics and fatty acid composition of some imported and indigenous varieties of rapeseed oil. *J. Food Sci. Technol. (India)* 20(1); 1983; 32-4

Imported rapeseed (*Brassica campestris*) oil contained erucic acid 0-3.8% as against 48.8-55.4% in indigenous variety. Content of erucic polyunsaturated acids were 7.8-13.6 and 27.0% in indigenous and 55.8-64.9 and 36% in imported varieties respectively. Differences were also found in iodine value, saponification value and Bellier turbidity temperature between imported and indigenous varieties of rapeseed. AA

SOYABEAN OIL

- 3986 CHANG (SS), SHEN (G-H), TANG (J), JIN (QZ), SHI (H), CARLIN (JT) and HO (CT). Isolation and identification of 2-pentenylfurans in the reversion flavour of soyabean oil. *J. Am. Oil Chem. Soc.* 60(3); 1983; 553-7

The volatile flavour compounds in a reverted soyabean oil, with a peroxide number of 6 meq/kg, were isolated by semi-continuous, counter-current, vacuum steam distillation. The four 2-pentenylfurans isolated by GC-MS were identified as cis- and trans-2-(2-pentenyl)-(1-pentenyl)furans, and a mixture of cis- and trans-2-(2-pentenyl)furans. The greater part the 2-(2-pentenyl)furans was identified as the cis-isomer. These compounds may be contributing to the reversion flavour of soyabean oil. KMD

- 3987 MIN (DB). Analysis of flavour qualities of vegetable oils by gas chromatography. *J. Am. Oil Chem. Soc.* 60(3); 1983; 544-5

Soyabean oil, hydrogenated soyabean oil, and corn oil were exposed to fluorescent light for different periods of time, and their flavour qualities were evaluated by sensory and gas-chromatographic methods. The correlation coefficients (r) of the flavour scores by sensory and instrumental analysis, as determined in 8 laboratories, were 0.95 for soyabean oil, 0.97 for hydrogenated soyabean oil, and 0.97 for corn oil. These results were very close to the γ -values of 0.99, 0.98, and 0.95 obtained earlier from 10 sensory panel members from one specific laboratory. Thus, the doubts expressed about the validity of these earlier results do not seem to be justified. KMD

SUNFLOWER OIL

- 3988 BALASARASWATHI (R) and RAJ (D). Studies on sunflower oil with reference to its keeping quality. *J. Food Sci. Technol. (India)* 20(1); 1983; 21-4
- Sunflower oil samples of five varieties (EC 68414, EC 68415, SuFI, SuF2 and K2) from irrigated and rainfed crops were stored in colourless bottles for 180 days and examined at every 30th day for peroxide value (PV), free fatty acid (FFA), thiobarbituric acid value (TBA) anisidine value (AV) and picric acid value (PAV). The mean values of chemical tests of irrigated and rainfed crops were: PV 5.540 and 5.637 ml of 0.02N sodium thiosulphate/g of oil; FFA 5.12 and 2.64 (% oleic acid equivalent; TBA (OD. at 400 nm) 0.28 and 0.32; AV (OD. at 420 nm) 0.093 and 0.079 and PAV (OD. at 490 nm) 0.031 and 0.031 respectively. It was concluded that the keeping quality of the oil from rainfed crops was better than those from irrigated crops. KAR

FATS

- 3989 De MAN (JM). Consistency of fats: A review. *J. Am. Oil Chem. Soc.* 60(1); 1983; 82-7
- 3990 TAYLOR (SL), BERG (CM), SHOPTAUGH (NH) and TRAISMAN (E). Mutagen formation in deep-fat-fried foods as a function of frying conditions. *J. Am. Oil Chem. Soc.* 60(3); 1983; 576-80
- Deep-fat fried foods possess low levels of mutagenic activity, an appreciable level (>2.5 times the spontaneous mutation rate) being reached only under severely abusive frying conditions. French-fried potatoes would have to be fried for 35-40 minutes at the abnormally high temperature of 410 F or 210 C to reach such levels of mutagenic activity. Repetitive frying at 45 batches of French-fried potatoes and onion rings, in the same batch of shortening, did not increase mutagen formation. Repetitive frying of fish fillets in the same batch of shortening produced appreciable levels of mutagens in both the acidic and basic methylene chloride extracts. Increased mutagenic activity was noticed from the 7th batch onwards. Fish fillets fried in a particular batch of frying oil, over a one-week period in a local restaurant, contained much lower levels of mutagenic activity. KMD
- 3991 DE MAN (JM), DE MAN (L) and BLACKMAN (B). Melting point determination of fat products. *J. Am. Oil Chem. Soc.* 60(1); 1983; 91-4
- Several methods of determining melting points were compared, using a variety of fats as test material, viz:- margarine and soft margarine, oils, hard, butter, and hydrogenated canola oils. The Mettler dropping-point values were found to coincide with the extrapolated solid fat curves obtained using wide-line NMR, for all fats except butter-fat. The reproducibilities of the Mettler dropping point and softening point were excellent; that of the slip point method was poor. KMD
- 3992 SIMPSON (TD). Solid phases of trimargarin: A comparison of tristearin. *J. Am. Oil Chem. Soc.* 60(1); 1983; 95-7
- Experimental data (Raman and infrared spectroscopy, X-ray diffraction, and differential scanning calorimetry) confirm the existence of four, solid-state phases for trimargarin. On comparing the experimental data with the known results for tristearin, it becomes evident that the polymorphic

properties of triglycerides result from a balance of three dominant interactions: (i) end group planar interactions, (ii) lateral hydrocarbon chain interactions, and (iii) intermolecular interactions of glycerol units. Thus, it is not the end group planar interactions alone which govern the physical behaviour of lipids. KMD

SPICES AND CONDIMENTS

- 3993 TIWARI (R), DIKSHIT (RP), CHANDAN (NC), SAXENA (A), GUPTA (KG) and VADEHRA (DE). Inhibition of growth and aflatoxin B₁ production of *Aspergillus parasiticus* by spice oils. *J. Food Sci. Technol.* (India) 20(3); 1983; 131-2

The effect of oils of eucalyptus, ginger, thymol, cinnamon, anise, rosemary, orange bitter and nutmeg on the growth and aflatoxin B₁ production by *Aspergillus parasiticus* ATCC 15517 in yeast-extract-sucrose medium was studied. All the oils tested decreased the growth and toxin production at all the concentration tested (100, 200 and 300 ppm). Anise and cinnamon oils had most pronounced effect and completely inhibited the growth as well as toxin production at 200 and 300 ppm concentration. In other oils, at least 40% decrease in aflatoxin B₁ production was observed. The reduction in toxin level could be related to inhibition of growth of this fungus. KAR

TURMERIC

- 3994 PUROHIT (P), MUSTAFA (M) and OSMANI (Z). Insecticidal properties of plant extract of *Cuminum cyminum* Linn. *Sci. Cult.* 49(4); 1983; 101-3

Odoriferous essential oil extracted by steam distillation from dry seeds of *C. cyminum* (Cumin) was tested against mosquito larvae (*Aedes aegypti* L.), house fly (*Musca domestica* L.) and red cotton bugs (*Dysdercus cingulatus*) using aqueous suspension method. Cumin oil exhibited remarkable toxicity against 2nd and 3rd instar mosquito larvae with the former more susceptible than the latter. The oil did not, however, show any toxicity against housefly and cotton bug when tested by topical application on thorax and scutellum respectively. Larvacidal action of the essential oil against mosquito without showing toxicity to other insects displayed its selective toxic nature. The oil could be a possible safe alternative for mosquito control. BSN

- 3995 BALAKRISHNAN (KV), THOMAS (M), GEORGE (KM) and VERGHESE (J). A method for the evaluation of ethylene dichloride residue in turmeric dye. *Indian J. Technol.* 21(6); 1983; 247-8

Ethylene dichloride (EDC) residues may be lodged with the crystal lattice of curcuminoid dyes, and would then be missed by the EOA technique of residue measurement. Hence, the authors have developed the "Synthite" method - a modification of the EDA technique - which exploits the solubility of curcuminoids in aqueous sodium hydroxide. The EDC concentration measured by this method is many times greater than by that measured by the EDA technique - 7400 ppm as against 172 ppm. KMD

PEPPER

- 3996 RATNAWATHE (M) and LEWIS (YS). Maturity versus content of flavour principles in pepper. *Indian Food Ind.* 2(2); 1983; 60-61

SENSORY EVALUATION

- 3997 HEINTZ (CM) and KADER (AA). Procedure for the sensory evaluation on horticultural crops. *Hortscience.* 18(1); 1983; 18-22

Colour and texture of fresh horticultural crops can be measured by objective methods, but determination of flavour quality requires the use of subjective methods. The article describes the need for a sensory panel, limitations of laboratory sensory tests, sensory evaluation procedures, panel members, test environment, sample preparation, sample presentation, difference versus descriptive tests, and statistical methods. KAR

FOOD STORAGE

Nil

INFESTATION CONTROL AND PESTICIDES

- 3998 BARRER (PM). A field demonstration of odour-based, host-food finding behaviour in several species of stored grain insects. *J. Stored Prod. Res.* 19(3); 1983; 105-10

In order to demonstrate odour-based, host-food finding behaviour in field populations of stored grain insects, traps were inserted into the fabric of PVC covered, fully sealed, earth-walled storages at two sites in New South Wales, Australia. *Cryptolestes ferrugineus*, *Rhyzopertha dominica* and *Tribolium castaneum* were trapped relatively commonly, as were the economically less significant *Carpophilus dimidiatus*, *Typhaea stercorea* and *Ahasverus advena*. Trap odours from stored wheat contributed markedly to the attraction of all six species. Other species were taken also, mainly those associated with moist grain. These results are discussed in relation to the abundance of stored-product species in the trapping area. AA

- 3999 BELL (CH), COX (PD), ALLEN (LP), PEARSON (J) and BEIRNE (MA). Diapause in twenty populations of *Ephestia cautella* (Walker) (Lepidoptera: Pyralidae) from different parts of the world. *J. Stored Prod. Res.* 19(3); 1983; 117-23

- 4000 LONGSTAFF (BC) and EVANS (DE). The demography of the rice weevil, *Sitophilus oryzae* (L.) (Coleoptera: curculionidae), submodels of age-specific survivorship and fecundity. *Bull. Entomol. Res.* 73(2); 1983; 333-44

Experiments are described in which age-specific survivorship and fecundity of *Sitophilus oryzae* (L.) were determined over a wide range of environmental conditions (15.0-32.3 C and 11-14% grain moisture content). The data derived from these experiments, together with some previously published data, were used to develop mathematical submodels for these processes.

The models are continuous functions of time, grain moisture content and grain temperature. Rates of increase per week and per generation were calculated for the range of environmental conditions used. The results are discussed in relation to previously published work, and the potential usefulness of the submodels is discussed briefly. AA

- 4001 BRAUN (HE), MORROW (DC), RIPLEY (BD) and FRANK (R). Efficiency of water rinsing for the decontamination of used pesticide containers. *Arch. Environ. Contam. Toxicol.* 12(3); 1983; 257-64

The efficiency of water rinsings for the decontamination of emptied pesticide containers was investigated in the period 1979-1981; nineteen formulations representing seven insecticides and two fungicides were studied. Following normal emptying procedures, the amount of retained pesticides ranged from a low of 0.06% to a high of 7.48%. By successively rinsing with volumes of water equal to one-tenth of the volume of the containers, as many as five rinses were required to remove 99% of the retained formulation. When containers were held in an inverted position and allowed to drain one minute prior to rinsing, three successive rinsings were sufficient for most formulations to remove 99% of the retained pesticide. Decontamination by rinsing was achieved most readily with water-soluble concentrates and wettable powders while flowable suspensions appeared to be the most difficult to remove. AA

- 4002 BURRELL (RE), CORKE (CT) and GOEL (RG). Fungitoxicity or organoantimony and organobismuth compounds. *J. Agric. Food Chem.* 31(1); 1983; 85-8

- 4003 ASHOK KUMAR, DOHAREY (RB), PANDEY (GP) and VERMA (BK). Determination of residues of pirimiphos methyl in stored food grains by thin-layer chromatography. *Indian J. Agric. Sci.* 53(6); 1983; 460-62

Wheat and rice stored in bags in godowns of the Central Warehousing Corporation in New Delhi and Muzaffarnagar (Uttar Pradesh, India) were treated with pirimiphos methyl at the rate of 0.15, 0.30 and 0.45 g active ingredient/m². Samples (500 g) were drawn 72 hours and 7 days after treatment and were estimated for insecticide residues by TLC. In wheat, the residues were > 10 ppm after 7 days at all three doses of treatment. In rice sprayed at 0.15 g active ingredient/m², the residues after one week were > 1 ppm. MVG

- 4004 JILANI (G) and SU (HCF). Laboratory studies on several plant materials as insect repellants for protection of cereal grains. *J. Econ. Entomol.* 76(1); 1983; 154-7

Turmeric powder was found to be most effective against *S. granarius* and *R. dominica* and also the solvent extracts were most effective against *T. castaneum* as compared to the leaves of neem and fenugreek. The petroleum ether extract was most effective than the acetone and ethanol extracts. The petroleum ether extract of neem was the most effective of the three plant materials against penetration by *R. dominica*. KAR

- 4005 QUINLAN (JK) and MeGAUGHEY (WH). Fumigation of empty grain drying bins with chloropicrin, phosphine, and liquid fumigant mixtures. *J. Econ. Entomol.* 76(1); 1983; 184-7

Fumigants were evaluated for disinfecting the space beneath the drying floor in empty 114.5-m³ circular metal bins. Chloropicrin was effective at 946 ml/bin. A 473-ml of chloropicrin and 3.79 liter and 7.57 liter dosages of liquid fumigant containing carbon tetra chloride and carbon disulphide did not produce 100% insect mortality. A liquid fumigant containing ethylene

dichloride, carbon tetra chloride, and carbon disulphide did not produce 100% insect mortality. A liquid fumigant containing ethylene dichloride, carbon tetra chloride and ethylene dibromide did not kill all insects at 3.79 litres, but produced 100% mortality at 7.57% litres per bin. KAR

BIOCHEMISTRY AND NUTRITION

- 4006 SRIHARA (P) and ALEXANDER (JC). Protein quality of raw and autoclaved plant protein blends. *Can. Inst. Food Sci. Technol. J.* 16(1); 1983; 63-7
- The protein quality of both raw and autoclaved plant protein blends was evaluated in weanling male rats by determining the net protein ratio and the net protein utilization derived from liver nitrogen values. True digestibility of these blends was also determined in order to evaluate whether digestibility was the only factor that affected protein quality as revealed by the other parameters. Casein and lactalbumin were reference standards. Combinations of corn meal, whole wheat meal, ground polished rice, oats, white beans, and solvent-extracted meals of soyabean, peanut and sesame were studied. All blends were autoclaved at 1.034 kg/cm^2 (15 lb.) pressure for 20 minutes. Improvements in protein quality were obtained when each of the blends was autoclaved, but some blends showed greater improvements than others. In most cases the heat treatment resulted in greater digestibility which was directly reflected in higher net protein ratio and net protein utilization values. However, the relatively high true digestibility value for one of the raw blends was reduced by autoclaving. In spite of this, both the net protein ratio and net protein utilization were improved significantly by autoclaving. Therefore, other factors besides digestibility had an effect on protein quality. Certain plant protein blends can be effective substitutes for good quality animal proteins if adequate heat treatment is used. AA
- 4007 LIARDON (R) and HURRELL (RF). Amino acid racemization in heated and alkali-treated proteins. *J. Agric. Food Chem.* 31(2); 1983; 432-7
- 4008 CANDLISH (JK). Tocopherols content of some Southeast Asian foods. *J. Agric. Food Chem.* 31(1); 1983; 166-8
- 5,7,8-Trimethyltocol (α -tocopherol) has been assayed in a number of Southeast Asian foods. The local green vegetables are a valuable source of the vitamin, as is the widely utilized soyabean. AA
- 4009 EYRE (MD), PHILLIPS (DE), EVANS (IM) and THOMPSON (A). The nutritional role of S-methyl-L-cysteine. *J. Sci. Food Agric.* 34(7); 1983; 696-700
- Using the nitrogen balance technique, the effects of S-Methyl-L-cysteine on the protein quality of egg albumin, extracted microbial protein and Maris Bead bean as well as in amino acid mixtures has been evaluated. No sparing effect was observed for methionine or cystine under any of the experimental conditions investigated. Equally, with a minor exception, no serious deleterious effect appears to result from the feeding of S-Methyl-L-cysteine. AA

TOXICOLOGY AND HYGIENE

- 4010 MADHYASTHA (MS) and BHAT (RV). A simple and rapid detection method for aflatoxin using polythene mini column. *Curr. Sci.* 52(5); 1983; 222-3
- Polythene tubing (22 cm x 1 cm) made from ordinary polythene (0.2 mm thickness) was plugged at one end with cotton and anhydrous sodium sulphate was poured into the column to 1 cm height and covered with neutral alumina (1 cm) activated at 110 C for 2 hours. Silica gel (column chromatography grade, 60-120 mesh, activated at 110 C for 1 hour) was added to 1 cm height followed by TLC grade silica gel to 6 cm height. The top of the column was plugged with a piece of cotton. Contaminated wheat sample (50 g) was extracted with 100 ml acetone + water (85:15 v/v); 10 ml of the filtered extract was mixed with 10 ml of 20% aqueous lead acetate solution to remove interfering fluorescence materials. The mixture was filtered and the filtrate was rigorously shaken with 3 ml benzene for 3 minutes and allowed to stand. One ml from benzene layer was taken in a test tube and the packed column was inserted into the test tube to allow the ascending solution to reach TLC grade silica gel zone. The column was developed for 3 minutes in 5 ml chloroform-acetonitrile-isopropanol mixture (93:5:2 v/v/v) and observed under long wave UV light. A blue band above the neutral alumina zone indicated the presence of aflatoxins. The technique could also be used with contaminated rice and groundnut cake sample. MVG
- 4011 WALTHER (H-J), PARKER (CE), HARVAN (DJ), VOYKSNER (RD), HERNANDEZ (O), HAGLER (WM), HAMILTON (PB) and HASS (JR). Fast atom bombardment mass spectrometry of aflatoxins and reaction products of sodium bisulphite with aflatoxins. *J. Agric. Food Chem.* 31(1); 1983; 168-71
- Aflatoxins B₁S and G₁S, products of reaction of aflatoxins B₁ and G₁ with sodium bisulphite, were isolated by HPLC and analyzed by fast atom bombardment mass spectrometry (FAB-MS) using direct analysis and metal exchange reactions within the mass spectrometer. Molecular weight determinations and confirmation of identity of B₁S and G₁S were done by introduction of the compounds individually into the mass spectrometer or in the presence of LiCl, KCl, or NaCl to induce metal exchange reactions. B₁S and G₁S were found to be the respective sodium sulphonates of B₁ and G₁ with molecular weights of 416 and 432 amu. The parent aflatoxins and aflatoxins B₂ and G₂ yielded strong (M + 1)⁺ fragments on direct analysis by FAB-MS and the corresponding metal-containing fragments when ionized in the presence of other metal salts used. AA
- 4012 GORDON (JJ), INNS (RH), JOHNSON (MK), LEADBEATER (L), MAIDMENT (MP), UPSHALL (DG), COOPER (GH) and RICKARD (RL). The delayed neuropathic effects of nerve agents and some other organophosphorus compounds. *Arch. Toxicol.* 52(2); 1983; 71-82
- 4013 AVERBOOK (BJ) and ANDERSON (RJ). Electrophysiologic changes associated with chronic administration of organophosphates. *Arch. Toxicol.* 52(3); 1983; 167-72
- 4014 WOJECK (GA), PRICE (JF), NIGG (HN) and STAMPER (JH). Worker exposure to paraquat and diquat. *Arch. Environ. Contam. Toxicol.* 12(1); 1983; 65-70

- 4015 SHINODA (S), NAKAHARA (N), NINOMIYA (Y), ITOH (K) and KANE (H). Serological method for identification of *Vibrio parahaemolyticus* from marine samples. *Appl. Environ. Microbiol.* 45(1); 1983; 148-52
- Use of agglutination with antiserum against lateral flagella (H-agglutination) for the identification of *Vibrio parahaemolyticus* was studied. Sucrose-negative bacteria were isolated from seawater, and their characterization was carried out by traditional biological tests and slide agglutination with antiserum specific to lateral flagella of *V. parahaemolyticus*. Of 135 strains isolated, 78 were identified as *V. parahaemolyticus* by biological tests and were agglutinated with the above serum. Fifty-five strains did not agglutinate with the serum, and their biological characteristics were different from those of *V. parahaemolyticus*. Two strains also differed from *V. parahaemolyticus* in some biological characteristics but agglutinated with the antiserum. All clinically isolated *V. parahaemolyticus* strains also agglutinated with the above serum. These results suggest that our serological method is useful for the identification of *V. parahaemolyticus*, especially for samples in which there are many organisms related to *V. parahaemolyticus*, because many biological tests can be omitted. AA
- 4016 NISHIBUCHI (M) and SEIDLER (RJ). Medium-dependent production of extracellular enterotoxins by non-O-1-*Vibrio cholerae*, *Vibrio mimicus*, and *Vibrio fluvialis*. *Appl. Environ. Microbiol.* 45(1); 1983; 228-31
- 4017 KOURANY (M). Medium for isolation and differentiation of *Vibrio parahaemolyticus* and *Vibrio alginolyticus*. *Appl. Environ. Microbiol.* 45(1); 1983; 310-12
- 4018 GILLIGAN (PH), BROWN (L) and BERMAN (RE). Differentiation of *Clostridium difficile* toxin from *Clostridium botulinum* toxin by the mouse lethality test. *Appl. Environ. Microbiol.* 45(1); 1983; 347-9

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